RUSH
UNIVERSITY

Bulletin 2004 - 2005

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UNIVERSITY

Bulletin 2004-2005

Rush Medical College
College of Nursing
College of Health Sciences
The Graduate College

600 South Paulina Street
Chicago, Illinois 60612
(312) 942-7100
www.rushu.rush.edu

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2004

	X Courses*	Y Courses**	Z Courses***
Fall Quarter 2004			
New Student Orientation (BSN students only)	Aug. 30-Sept. 10	N/A	N/A
New Student Orientation (All programs except BSN)	Sept. 7-10	Sept. 7-10	N/A
Classes Begin	Sept. 13	Sept. 13	Sept. 7
Classes End	Nov. 19	Dec. 10	Dec. 10
Final Exams	Nov. 22-24	Dec. 13-17	Dec. 13-17
Graduation	Dec. 18	Dec. 18	Dec. 18
Graduation (Accelerated BSN)	Dec. 25		

* College of Nursing and College of Health Sciences
** 1st year, Rush Medical College and The Graduate College
*** 2nd year, Rush Medical College

2005

	X Courses*	Y Courses**	Z Courses***
Winter Quarter 2005			
New Student Orientation (BSN students only)	Dec. 13-17	N/A	N/A
Classes Begin	Jan. 3	Jan. 3	Jan. 3
Classes End	Mar. 11	Mar. 11	Mar. 11
Final Exams	Mar. 14-18	Mar. 14-18	Mar. 14-18
Graduation	Mar. 19	Mar. 19	N/A
Spring Quarter 2005			
Classes Begin	Mar. 28	Mar. 28	Mar. 28
Classes End	June 3	June 10	Apr. 27
Final Exams	June 6-10	June 13-17	Apr. 28-May 6****
Graduation	June 11	June 11	N/A
Summer Quarter 2005			
Classes Begin	June 20	June 20	N/A
Classes End	Aug. 24	Aug. 24	N/A
Final Exams	Aug. 25-26	Aug. 25-26	N/A
Graduation	Aug. 27	Aug. 27	N/A
Fall Quarter 2005			
New Student Orientation (BSN students only)	Aug. 29-Sept. 9	N/A	N/A
New Student Orientation (All programs except BSN)	Sept. 6-9	Sept. 6-9	N/A
Classes Begin	Sept. 12	Sept. 12	Sept. 6
Classes End	Nov. 18	Dec. 9	Dec. 9
Final Exams	Nov. 21-23	Dec. 12-16	Dec. 12-16
Graduation	Dec. 17	Dec. 17	N/A
Graduation (Accelerated Nursing)	Dec. 24	N/A	N/A

* College of Nursing and College of Health Sciences
** 1st year, Rush Medical College and The Graduate College
*** 2nd year, Rush Medical College
**** Study period follows for USMLE, Step 1

Degree and Certificate Programs

Rush Medical College

Doctor of Medicine

College of Nursing

Bachelor of Science in Nursing
- Seven-quarter option
- Four-quarter option

Master of Science in Nursing
Post-Master's Certificate
Doctor of Nursing
Doctor of Nursing Science

Clinical Specialist and Practitioner programs

Acute Care	Neonatal
Adult	Pediatric
Anesthesia	Public Health
Critical Care	Psychiatric/Mental Health
Family	Medical/Surgical

College of Health Sciences

Bachelor of Science
- Clinical Laboratory Sciences (formerly Medical Technology)
- Perfusion Technology
- Vascular Ultrasound

Master of Arts
- Health Care Ethics

Certificate
- Health Care Ethics
- Spirituality and Health

Master of Science
- Clinical Laboratory Management
- Clinical Laboratory Sciences (formerly Medical Technology)
- Clinical Nutrition
- Health Systems Management
- Medical Physics
- Occupational Therapy
- Speech-Language Pathology

Doctor of Audiology

The Graduate College

Master of Science
- Anatomy and Cell Biology
- Biochemistry
- Clinical Research
- Immunology and Microbiology
- Neurosciences
- Pharmacology
- Radiological Sciences

Doctor of Philosophy
- Anatomy and Cell Biology
- Biochemistry
- Immunology and Microbiology
- Medical Physics
- Molecular Biophysics and Physiology
- Neurosciences
- Pharmacology

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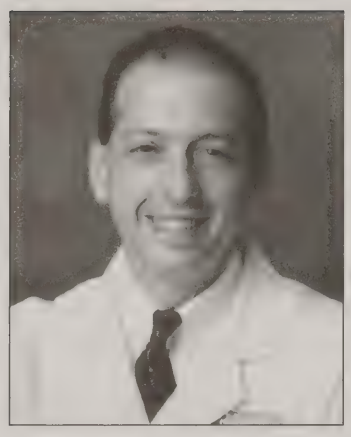

"Rush University is dedicated to training in the clinical and basic sciences of health care and medical research. Its four colleges, Rush Medical College, the College of Nursing, the College of Health Sciences, and The Graduate College, together train over 1,200 students. In addition, Rush University Medical Center trains over 600 residents and fellows in the graduate programs of clinical education for physicians. The desire to participate in the education of trainees at all levels has attracted some of the most outstanding scientists, physicians, nurses and allied health professionals in the country to Rush. Our primary interest at the Medical Center is to provide the very best in patient care. Trainees in the clinical disciplines will be prepared for the challenges that they will face by active participation in clinical care throughout most of their training. Basic scientists will work as part of those teams, and understand the immediate relevancy of their work. The many linkages of basic science programs with clinical ones often stimulates each side to creative solutions to important problems.

Rush University Medical Center is one of the nation's leading academic health centers. I am pleased you have chosen Rush for your training. We take the responsibility seriously. At any time during your training, please feel free to contact one of your Deans or me for any suggestions or to address any issues. Training is exciting as well as challenging. All of us are here to support you. Thanks for choosing Rush."

Larry Goodman, M.D.
President, Rush University;
Chief Executive Officer,
Rush University Medical Center

Mission

Rush University Medical Center is a multifaceted health services corporation and the foundation of the Rush System for Health. The primary purposes of the Medical Center are:

- To provide comprehensive, coordinated health services to people in the Chicago metropolitan area and selected tertiary services to people throughout the nation
- To educate and train health professionals to meet national needs as well as those of the Rush System, with special emphasis on primary care practitioners
- To advance health care knowledge by fostering basic, applied and clinical research, which also serves to enhance clinical programs
- To improve the West Loop and University Village communities, of which the Medical Center is a member
- To foster the individual growth and satisfaction of Medical Center employees and staff.

Vision

Rush University Medical Center will be recognized as Chicago's premier health services organization based on the superiority of its clinical programs, its application of the latest medical technologies, the excellence of its education and research, and its emphasis on health promotion and patient education, disease prevention and cost-effective outcomes.

Values

We, the employees of Rush University Medical Center, commit ourselves to four shared values. These values are the basis for all the care we provide, whether direct or indirect, as well as for our dealings with each other. It is our pledge and expectation that all employees and staff will live out these values while working at Rush University Medical Center.

- **Excellence:** We continually improve the way we administer services to ensure the highest quality patient care, education of patients, staff and students.
- **Compassion:** We treat all people in a caring way, with respect and dignity.
- **Social Responsibility:** Our obligation to serve is appropriately linked and balanced with responsible stewardship of resources.
- **Faith in Self and Others:** We believe in each person's ability and willingness to work together to do what is right.

The Medical Center

Rush University Medical Center is one of Chicago's oldest health care organizations. Its heritage extends back to 1837 when Rush Medical College was established. St. Luke's Hospital, founded in 1864, and Presbyterian Hospital, founded in 1883, merged in 1956 to form Presbyterian-St. Luke's Hospital. The subsequent incorporation of these pioneer institutions in 1969 created Rush-Presbyterian-St. Luke's Medical Center. In 2004 Rush University Medical Center includes:

- Rush University, a health professions higher education institution that enrolled 1,253 students in 2003-04.
- The main hospital, with 824 beds, is a major referral center that provides primary care to its immediate community and secondary and tertiary care to patients from across the country. The hospital admitted more than 27,000 patients and performed over 17,740 operations the last fiscal year.
- The Johnston R. Bowman Health Center for the Elderly, a short-term rehabilitation facility (110 beds) and a national model for hospital-based geriatric care. The center also provides 30 residential apartments for seniors.
- Rush Children's Hospital, a 120 bed pediatric facility within Rush that provides medical and surgical care for newborns, infants, children and adolescents.

- Corporately affiliated with the Medical Center are Rush North Shore Medical Center in Skokie, Illinois (268 beds), Rush-Copley Medical Center in Aurora, Illinois (142 beds) and Rush Oak Park Hospital in Oak Park, Illinois (296 beds). Riverside Health Care, Kankakee, Illinois is affiliated through a joint venture agreement.

Educational Network

The following 13 colleges and universities in five states are Rush University Affiliated Colleges:

Beloit College, Beloit, Wis.
Benedictine University, Lisle, Ill.
Carleton College, Northfield, Minn.
Dominican University, River Forest, Ill.
Fisk University, Nashville, Tenn.
Knox College, Galesburg, Ill.
Lawrence University, Appleton, Wis.
Macalester College, St. Paul, Minn.
Monmouth College, Monmouth, Ill.
Mount Mary College, Milwaukee, Wis.
North Central College, Naperville, Ill.
Ripon College, Ripon, Wis.
Wheaton College, Wheaton, Ill.

Rush University Mission

The purposes of Rush University are to educate students as practitioners, scientists, and teachers who will become leaders in advancing health care and to further the advancement of knowledge through research. As a major component of Rush University Medical Center, the University integrates patient care, education, and research through the practitioner-teacher model. Rush University encourages growth of its students by committing itself to the pursuit of excellence, to free inquiry, and to the highest intellectual and ethical standards.

The University

Rush University is the academic component of Rush University Medical Center. Founded in 1972, the University has expanded from one college and fewer than 100 students to four colleges and over 1,200 students. It includes Rush Medical College, the College of Nursing, the College of Health Sciences, and The Graduate College. **Rush Medical College** is named for Benjamin Rush, a signer of the Declaration of Independence, who was a physician from Pennsylvania. Rush Medical College was chartered in 1837, opened officially on December 4, 1843, with 22 students enrolled in a 16-week course. During the first century of operation more than 10,000 physicians received their training at Rush Medical College. Rush Medical College was affiliated with the University of Chicago from 1898 until 1942, when the medical college temporarily suspended its educational program, though it continued its corporate existence. Its faculty continued undergraduate and graduate teaching of medicine and the biological sciences as members of the faculty of the University of Illinois. The charter of the medical college was reactivated in 1969 when it became part of the Medical Center, and, in 1971, it reopened with a class of 66 first-year students and 33 third-year students. First-year class size reached its projected maximum of 120 in 1976. More than 3,400 M.D. degrees have been awarded since 1971. **The College of Nursing** represents a combined heritage dating back to the late nineteenth century when its first antecedent, the St. Luke's Hospital Training School of Nursing, opened in 1885 to offer diploma education to nurses. In 1903, the Presbyterian Hospital School of Nursing accepted its first students. From 1956 to 1968 nurses were taught at the merged Presbyterian-St. Luke's Hospital School of Nursing. Before the establishment of the College of Nursing in 1972, more than 7,000 nurses had graduated from these three schools. Today, approximately 150 baccalaureate, master's and doctoral nursing students graduate each year. **The College of Health Sciences**, established in 1975, traces its origins to the School of Medical Technology sponsored by Presbyterian-St. Luke's Hospital from 1959 to 1972. This school was the second largest of its kind in the city of Chicago. During its operation, it provided a one-year professional internship program to more than 200 baccalaureate students in medical technology. Today, the College of Health Sciences offers one doctoral program, nine programs at the master's level, in addition to, bachelor's programs in clinical laboratory sciences, perfusion technology and vascular ultrasound. **The Graduate College** was established as a separate academic unit in January 1981, having previously been organized as the Graduate School within the College of Health Sciences. The Graduate College is responsible for educational programs in the basic sciences and offers master's and doctoral degrees in seven disciplines.

The Philosophy

The University was established in response to demands for a more effective and humane health care system that could supersede highly specialized, fragmented and often geographically inaccessible patient care services. The Rush System for Health, the conceptual framework adopted to address these problems, offers a prototype that could become a model for the delivery of health care in this country. This system is unique in many ways. The central concept is that the academic and care elements of health delivery systems must be united. Implementation of this concept differentiates Rush from many typical health universities. At the foundation of the University is an outstanding patient care setting. Rush University Medical Center is recognized as one of the top 20 hospitals in the country; its existence as a high quality patient care institution made the development of the University feasible. Many faculty and students have clinical responsibilities in this setting or in one of the institutions linked to Rush University Medical Center. Therefore, faculty members may function both as practitioners and as teachers. This combination ensures that faculty members bring up-to-date knowledge to the clinical setting and professional expertise to the classroom. Another distinctive feature of Rush University is its commitment to health maintenance and illness prevention. At Rush one major focus in the classroom is on pathology and prevention of disease. This is supplemented by clinical experiences with inpatients and outpatients.

Programs of Study

Degrees Rush University confers include the Bachelor of Science (B.S.) in Clinical Laboratory Sciences, Perfusion Technology, and Vascular Ultrasound, the Bachelor of Science in Nursing (B.S.N.), Master of Arts (M.A.), Master of Science (M.S.), Master of Science in Nursing (M.S.N.), Doctor of Nursing (N.D.), Doctor of Nursing Science (D.N.Sc.), Doctor of Audiology (Au.D.), Doctor of Medicine

(M.D.) and Doctor of Philosophy (Ph.D.). Within the undergraduate nursing program, an R.N. completion option meets the needs of registered nurses for a university education. All baccalaureate programs begin in the junior year of study after completion of two years of course work at other accredited colleges or universities. The Master of Science is offered by the College of Health Sciences, the College of Nursing and The Graduate College. The College of Nursing has many specialties within the departments of adult health, community and mental health, and women's and children's health nursing. In the College of Health Sciences, a student may major in clinical laboratory management, clinical laboratory sciences, clinical nutrition, health systems management, occupational therapy, medical physics, perfusion technology, speech-language pathology and vascular ultrasound. The College of Health Sciences also offers a Master of Arts degree in Health Care Ethics and a Doctor of Audiology. The Graduate College offers majors in clinical research, biochemistry, immunology and microbiology, medical physics, molecular biophysics and physiology, neurosciences, and pharmacology. Students may also enroll in concurrent M.D./Ph.D.or M.D./M.S. programs.

Student Characteristics: In Fall 2003 students ranged in age from 20 to 61, with 187 undergraduate students averaging 26.8 years; 579 graduate students, 31.6 years; and 487 medical students, 25.3 years. Over 76 percent of the students lived in Illinois prior to entering Rush. The 1,253 students include 45 Latinos, 260 Asian/Pacific Islanders, 75 African-American (non-Latino) and 33 international students.

Fall 2003 Enrollment	Men	Women	Total
Rush Medical College	230	257	487
College of Nursing	39	357	396
College of Health Sciences	45	191	236
The Graduate College	40	38	78
Unclassified	17	39	56
Total	**371**	**882**	**1,253**

University Statement on Student Conduct

Rush University seeks to create a climate that encourages its members to act as responsible adults in an academic community. Generally, institutional disciplinary measures are invoked only in response to conduct that adversely affects the University/Medical Center's pursuit of its educational objectives and mission. Penalties may range from a warning to probation, suspension, or expulsion from the University/Medical Center. A partial list of disruptive behaviors that would subject a student to disciplinary action includes the following:

- ALL forms of academic dishonesty.
- OBSTRUCTION or disruption of teaching, research, administration, or other University/Medical Center activities.
- THEFT of or damage to University/Medical Center property or the property of a member of the University/Medical Center community.
- PHYSICAL abuse of any person or action that threatens or endangers the safety of others.
- MISREPRESENTATION, falsification, alteration, or misuse of University/ Medical Center documents, records or identification.
- UNAUTHORIZED use or entry of University/Medical Center facilities.
- CONDUCT that is inconsistent with the ethical code of the profession the student is preparing to enter.
- UNLAWFUL use or possession of controlled substances.
- UNLAWFUL use or possession of firearms or other weapons.

University Statement on Academic Honesty

Rush University students and faculty, belong to an academic community with high scholarly standards. As essential as academic honesty is to the relationship of trust fundamental to the educational process, academic dishonesty violates one of the most basic ethical principles of an academic community, and will result in sanctions imposed under the University's disciplinary system. A partial list of academically dishonest behaviors that would subject a student to disciplinary action includes:

- CHEATING: Using unauthorized material or unauthorized help from another person in any work submitted for academic credit
- FABRICATION: Inventing information or citations in an academic or clinical exercise
- FACILITATING ACADEMIC DISHONESTY: Providing unauthorized material or information to another person
- PLAGIARISM: Submitting the work of another person or persons, as one's own without acknowledging the correct source
- UNAUTHORIZED EXAMINATION BEHAVIOR: Conversing with another person, passing or receiving material to/from another person or temporarily leaving an examination site to visit an unauthorized site

Research

Research expenditures totaled more than $100 million last year. The faculty of the University encourages investigation of both normal and disease processes and the distribution and delivery of health care services. The faculty believes that inquiry into these areas by students should be encouraged if they are to become practicing professionals who will continue to learn throughout their careers.

Diversity, Equal Opportunity, Affirmative Action

In keeping with its goal of promoting diversity through its equal opportunity and affirmative action programs, Rush University is committed to attracting students who will enable the student body to achieve the educational benefits of diversity, and to provide services to all students, faculty, and other employees on a nondiscriminatory, equitable basis. Beverly B. Huckman, Associate Vice President for Equal Opportunity in the Office of the President, has been designated to oversee the implementation of this policy. The Equal Opportunity Coordinator may be reached by telephone at (312) 942-7093 or by mail (Suite 128, Professional Building). Among the responsibilities of this office are:

- Recommending and implementing policies and programs related to diversity, cultural and gender sensitivity, equal opportunity, affirmative action, prevention of discrimination and harassment, and the Americans With Disabilities Act.
- Encouraging the recruitment of persons from all groups for administrative, faculty, and student positions.
- Mediating faculty, resident, and student complaints related to discrimination or harassment (See "Harassment" within the "Policies and Procedures" section of this handbook).
- Additional resources may be found in the offices of the Rush Medical College Assistant Dean for Minority Affairs, the Rush College of Nursing Director of Multicultural Affairs, and Human Resources.

Harassment, Policies and Procedures

The Policies and Procedures on Sexual and Other Harassment for the University and nonacademic sectors of the institution are intended to increase the awareness of Rush's long-standing commitment to preventing harassment and to focus on the internal resolution of any complaints. Under these policies and procedures, the more familiar category of sexual harassment as well as harassment related to race, color, religion, sexual orientation, national origin, ancestry, age, marital or parental status, or disability is prohibited. The provisions include protections for and prohibit retaliation against an individual making a complaint or supplying information about a complaint. They also incorporate protections for a person who considers himself or herself accused in bad faith. While all administrators and supervisors have responsibility under this document, certain people have been specifically designated to deal with concerns and complaints that might come forward. Inquiries or complaints of harassment from students, residents, or faculty members will be handled through the office of Beverly B. Huckman, Associate Vice President for Equal Opportunity, at (312) 942-7093. Copies of the Policies and Procedures are available from the Office for Equal Opportunity, 128 Professional Building.

Drug-free Campus and Workplace

Rush University Medical Center is committed to achieving and maintaining a drug-free campus and workplace. The Medical Center has established a drug-free policy consistent with its commitment and goals. The policy states in part:

> The illegal manufacture, distribution, dispensing, use, sale and/or possession of controlled substances on Medical Center property or while performing Medical Center business is strictly prohibited. An employee or student engaged in any such conduct will be subject to discipline up to and including expulsion or termination. In addition, students and employees are subject to all applicable criminal penalties under local, state or federal law for unlawful possession or distribution of illicit drugs and alcohol. Within five days of the conviction, employees and students must report to the Medical Center any conviction for violation of a criminal drug statute occurring within the Medical Center. The health risks associated with the use of illicit drugs and the abuse of alcohol are many and varied. Some drugs may cause psychological and physical dependence or addiction. Others attack the central nervous system, making the user dangerous to himself and others. In the extreme, they can result in convulsions, psychosis, coma and possible death.

An Employee Assistance Program is available for any employee experiencing problems from, among other things, drug or alcohol abuse or dependency. Use of the program can be made by contacting the Employee Assistance Program. Students may seek similar assistance through the Student Counseling Center by calling extension 2-3687. The drug-free policy is a condition of employment that all employees accept by continuing to work here. It is also a condition of enrollment that all students accept by continuing to study here.

Accreditation

Rush University

Higher Learning Commission of the North Central Association of Colleges and Schools
30 North LaSalle Street, Suite 2400
Chicago, IL 60602
(312) 263-0456

Rush Medical College

Accreditation Council for Continuing Medical Education (ACCME)
515 North State Street, Suite 2150
Chicago, IL 60610
(312) 755-7401

Accreditation Council of Graduate Medical Education (ACGME)
515 North State Street, Suite 2000
Chicago, IL 60610
(312) 755-5000

American Medical Association (AMA)
515 North State Street
Chicago, IL 60610
(312) 464-4933

Association of American Medical Colleges (AAMC)
2450 N Street NW
Washington, DC 20037
(202) 828-0400

Liaison Committee on Medical Education (LCME)
2450 N Street NW
Washington, DC 20037
(202) 828-0596

College of Nursing

Commission on Collegiate Nursing Education (CCNE)
One DuPont Circle NW, Suite 530
Washington, DC 20036
(202) 463-6930

Council on Accreditation of Nurse Anesthesia Educational Programs
222 Prospect Avenue, Suite 304
Park Ridge, IL 60068
(847) 692-7050

College of Health Sciences

Department of Clinical Laboratory Sciences

National Accrediting Agency for Clinical Laboratory Sciences (NAACLS)
8410 West Byrn Mawr Avenue, Suite 670
Chicago, IL 60631
(773) 714-8880

Department of Clinical Nutrition

American Dietetic Association (ADA)
120 South Riverside Plaza, Suite 2000
Chicago, IL 60606
(800) 877-1600

Department of Communication Disorders and Sciences

Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA)
10801 Rockville Pike
Rockville, MD 20852
(301) 897-5700

Educational Standards Board of the American Speech-Language Hearing Association (ASHA)
10801 Rockville Pike
Rockville, MD 20852
(301) 897-5700

Department of Health Systems Management
Accrediting Commission on Education for Health Services Administration (ACEHSA)
730 Eleventh Street NW, Suite 400
Washington DC 20001
(202) 638-5131

Department of Occupational Therapy
Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association (AOTA)
4720 Montgomery Lane
P.O. Box 31220
Bethesda, MD 20824
(301) 652-2698

Perfusion Technology Program
Commission on Accreditation of Allied Health Education Programs (CAA-HEP)
35 East Wacker Drive, Suite 1970
Chicago, IL 60601
(312) 553-9355

Department of Religion, Health and Human Values
Association for Clinical Pastoral Education, Inc. (ACPE)
1549 Clairmont Road, Suite 103
Decatur, GA 30033
(404) 320-1472

Authorization

The Illinois Board of Higher Education has authorized all degree programs offered through Rush University.

Licenses

Department of Public Health
State of Illinois
Cook County Board of Health

Memberships

Association of American Medical Colleges
American Association of Colleges of Nursing
Federation of Independent Illinois Colleges and Universities
Association of Schools of Allied Health Professions
Association of University Programs in Health Administration
National League for Nursing
Association for Health Services Research
American Hospital Association
Illinois Hospital Association
Voluntary Hospitals of America
Metropolitan Chicago Health Care Council
Blue Cross/Blue Shield Health Care Service Corporation

Human Investigation

Any project or study involving human subjects must have approval of the Medical Center Committee on Human Investigation. Studies in the community as well as within the Medical Center must have this approval. The Office of Research Administration handles all requests and has established the protocol for proper investigative procedures.

Institutional Animal Care and Use Committee

All investigators and teachers that use animals in scientific projects and in classes must submit their plans to the Institutional Animal Care and Use Committee (IACUC) for approval prior to carrying out the project or program. Members of the committee are appointed by the Associate Vice President for Research and include representation from the community and from the student body. The director of the Comparative Research Center coordinates the work of the IACUC.

Alumni Relations

The Office of Alumni Relations is located in the 1700 W. Van Buren Building. It has been established to provide a planned, coordinated program of service and activities of mutual interest and benefit to Rush University, the Medical Center, and all alumni. Although Rush University, founded in 1972, is a relatively young institution, it has already conferred more than 10,000 degrees in the health professions since its inception, and this dynamic growth continues. The objectives of the Alumni Relations office are to provide channels for alumni of Rush Medical College, the College of Nursing, the College of Health Sciences, The Graduate College and the House Staff to remain informed of current developments at the Medical Center; develop an active interest in and involvement with their alma mater; maintain contact with fellow alumni and faculty; take advantage of continuing education opportunities offered through Rush University; respond positively through both financial and philosophical support; and promote and perpetuate the high standards of excellence in patient care, education and scientific advancement consistent with the objectives of Rush University Medical Center. Formally organized alumni associations exist for graduates of Rush Medical College, the College of Nursing, the Department of Health Systems Management, and the Department of Occupational Therapy. As the numbers of alumni increase from the other programs, organizational efforts are being undertaken for them as well. For more information concerning membership in one of the existing alumni associations or services available through the Office of Alumni Relations, call (312) 942-7165 or (312) 942-7227 (Medical College, Health Sciences, Graduate College) or (312) 942-7199 (Nursing).

Alumni Associations

Rush Medical College. The Alumni Association of Rush Medical College is an active organization dedicated to supporting the educational goals of the college. Purposes of the organization are to maintain communications between alumni and the college; to honor alumni who have given distinguished service to the profession of medicine and/or to their alma mater; to promote and encourage the highest standards of medical education; to assist the faculty and staff of the college in any way possible and to provide financial support for the operation of Rush Medical College. Prior to its reactivation in 1969, Rush Medical College conferred 10,976 Doctor of Medicine degrees. Alumni and Trustees of the Medical Center were responsible for keeping active the original charter granted to the college by the State of Illinois in 1837. The alumni also maintained the Rush Medical College Library and made financial grants for post-graduate education during the college's inactive period. Rush alumni practice in all 50 states and in 11 foreign countries. Since the reactivation of Rush Medical College in 1969, Rush University has conferred more than 3,400 Doctor of Medicine degrees. The Alumni Association is represented on the Board of Trustees of Rush University Medical Center by two alumni who are elected annually, the president and immediate past-president of the Alumni Association.

College of Nursing. The Rush-Presbyterian-St. Luke's Nurses Alumni Association is an active organization with the following goals: to unite the graduates of Rush University College of Nursing, Presbyterian-St. Luke's Hospital School of Nursing, Presbyterian Hospital School of Nursing, and St. Luke's Hospital School of Nurses for mutual assistance, protection, and preservation of fellowship; to promote the professional and educational advancement of nursing; to provide financial assistance and offer networking advice to current students; and to support the interests of the Rush University programs in nursing. All graduates of these schools of nursing are considered active members of the Alumni Association. Each year, graduates return at homecoming to tour the facilities and to learn what is happening at the Medical Center. From 1887 through 1968 there were 7,221 graduates of the diploma programs of the various schools. Many of them have served with distinction around the world. Since the founding of the College of Nursing in 1972, Rush University has conferred over 4,900 nursing degrees. Many alumni support the University nursing programs financially through the Golden Lamp Society, which provides leadership gifts to the college.

Alumni Association of the Department of Health Systems Management. This association is dedicated to the following goals: to advance knowledge and techniques in the field of health systems management; to maintain interest in potential and enrolled students; to facilitate graduate participation in continuing education activities; to provide objective recommendations for the development of the program; to provide opportunities for graduates to share their work experiences with students and other alumni; to serve as a network for job search and career advancement. The first class of ten students graduated in June 1981. Since that time the Alumni Association has grown to 270 members.

Rush University Occupational Therapy Alumni Association. This association's mission is to seek to advance the knowledge of its members in the field of occupational therapy; to promote collaboration, understanding, and fellowship; to offer a means to obtain and share research and information for the promotion of best practice; to provide a mechanism for alumni to act in an advisory capacity to faculty and a mentor capacity to students; and to communicate with other professional groups to expand the understanding of the occupation. The first class of occupational therapy students graduated in 1982.

Rush Surgical Society. This society recognizes the many surgeons who have been trained at the Medical Center but who may not have been graduates of Rush Medical College. Members automatically include all past, present and future trainees and faculty who have participated in a surgical laboratory or surgical clinical program. The society's purpose is to support the Medical Center by promoting educational, scientific, and social aspects relating to surgery.

Medical Society. An equivalent group was established in medicine called the Rush Internal Medicine Alumni Association. This society was officially launched in April 1987. The society's purpose is to facilitate contact and communication among former internal medicine house officers and to honor alumni who have given distinguished service to the profession of medicine.

Biomedical Communications

The Department of Biomedical Communications provides media production, audio/visual support and photographic services for patient care, education, research, administration and marketing. Offices are located on the fourth floor of the Armour Academic Center, suites 408 to 423.

Bookstore

The Rush University Bookstore is a health sciences bookstore serving the needs of students, faculty and staff at Rush University Medical Center. The bookstore stocks the required and recommended textbooks for courses offered at Rush University, as well as an assortment of reference and review books. Rush students and staff receive a 5% discount on stocked books when presenting a Rush I.D. Special orders are handled by the bookstore and will generally be received in one or two weeks. The discount does not apply to special orders. Lab coats and medical-surgical equipment are also stocked. School supplies, greeting cards, computer software, and Rush insignia items are also available. The Rush University Bookstore is located on the ground level of the Armour Academic Center.

The Campus

The main campus of the University/Medical Center is located on the West Side of Chicago not far from downtown (the Loop). The area surrounding the campus is undergoing much redevelopment. Of particular interest is the Chicago Technology Park, which incorporates biomedical research facilities and programs. New townhomes and condominiums have been built in Garibaldi Park, just east of the campus, and many new businesses are flourishing in the Taylor Street area. With other health care facilities in the Medical Center District including: the University of Illinois at Chicago-West Campus, John H. Stroger, Jr. Hospital of Cook County, Westside Veterans Administration Hospital, and Illinois State Psychiatric Institute, Rush is centrally and conveniently located. The Marriott Chicago Downtown at the Medical District, a hotel and fine dining establishment, is located at the corner of Harrison Street and Ashland Avenue adjacent to the Medical Center. The main campus now consists of 22 buildings. This includes facilities for achieving the goals of the Medical Center: patient care, education and research. The main campus also includes an indoor parking facility.

Armour Academic Center. This center is the hub of most student activities. The Library of Rush University and the McCormick Educational Technology Center are located in the Armour Academic Center, along with classrooms, laboratories, academic computing, specialized facilities, the Student Services Suite, the Office of Student Affairs, the Rush University Bookstore, cafeteria, and the administrative offices of Rush Medical College, the College of Nursing, the College of Health Sciences, and The Graduate College.

Medical Center and Facilities. Laboratories are located throughout the Medical Center complex but are principally found in Jelke-South center. Additional departmental laboratories are located in the Cohn Research Building and in the Tech 2000 building located at 2000 W. Harrison Street. In addition to the main campus, Rush includes Rush North Shore Medical Center, located in Skokie, and Rush-Copley Memorial Hospital located in Aurora. Directly across the Eisenhower Expressway from the main campus is an office building for finance, legal affairs, philanthropy and communication, the data center and other functions of the Medical Center. In addition Unicare Health Plans has medical offices for patients in the building. Tennis courts and a running track are located on the main campus as well as an indoor parking facility. On-campus housing for students includes studio, one-bedroom and two-bedroom apartments at Center Court Gardens, located just east of the Medical Center. Many students also live in private housing in the area surrounding the Medical Center.

The Office of Student Affairs distributes a campus map to new students and publishes a student handbook which includes a yellow pages section providing locations and telephone numbers of persons, offices, departments and buildings of interest to students.

Counseling Services

Open all year, the Student Counseling Center provides professional counseling at no charge to students for a variety of concerns ranging from academic problems to issues of personal development. Students have sought help for test anxiety, insomnia, study difficulties, career questions, eating disorders, parenting concerns, general anxiety, depression, and marital and/or relationship problems. In addition to counseling of individuals and couples, the center offers group and workshop experiences. The center has offered support groups for male nursing students, first-year medical students, and students with compulsive eating problems; in addition, a workshop on assertiveness training for medical school clerkships has been offered. The Student Counseling Center maintains strict standards of privacy and confidentiality. No information on an individual student is released to anyone, inside or outside of the University, without the prior consent of the student. No student contact with the Counseling Center becomes a part of any other University record. The office is located in suite 443 of the Armour Academic Center, (312) 942-3687.

General Educational Resources

The Office of General Educational Resources (GER) is responsible for providing students, faculty and staff with a wide range of services necessary to carry out both laboratory and classroom instruction. GER's management of the spacious, flexible facilities located on the seventh and ninth floors of Armour Academic Center enables it to meet multiple needs for educational space, equipment, and other support. Additionally, GER manages the flexible classrooms located at the south end of the seventh floor and also operates the Quick Copy Center. The multidisciplinary laboratory complex consists of eight laboratory/classrooms, seven support rooms and a central core demonstration area. Within the area are the electron microscope facilities and a small darkroom for scientific use by faculty and students. GER staff offers cardiopulmonary resuscitation and basic life-support training for individuals and groups. The office is responsible for provision of microscopes and other scientific equipment for educational uses, including the microscope rental plan. Students and faculty who have instructional needs that which require special accommodations should check with the supervisor of the GER for assistance. GER space is routinely open 50 hours during the week for scheduled classes, co-curricular instructional activities and study. Teaching and learning aids, such as microscopes, can be made available upon request. Classroom space is usually open for study purposes from 5:00 p.m. to 8:00 a.m.

The Quick Copy Center. Located on the seventh floor of Armour Academic Center, this facility duplicates materials for educational

purposes as well as general needs. A full range of services, including front and back copying, electronic page formatting with graphics and typesetting, and multiple binding options are offered through the center. Special rates are available to students for note cooperatives and organizations. Personal work of over ten copies can be accommodated for faculty and students at a reasonable fee.

Microscope Rental. Students must have microscopes for clinical laboratory sciences, anatomy, and pathology courses. Students who do not own a microscope may rent one through Rush University (see Financial Affairs). A carrying case and an off-campus pass (valid for the duration of the rental period) are provided with each rental microscope. Since students will be held responsible for microscope damage and loss, homeowner's or apartment insurance is recommended.

International Services

The Office of International Services (OIS) works with international students, residents, researchers and faculty who are planning to study or to work at Rush and who will need authorization from the United States Citizenship and Immigration Service (USCIS) to do so. Functions of the Office of International Services include:

- Rush representative to USCIS, the Department of State and the Educational Commission for Foreign Medical Graduates (ECFMG) regarding the status of international students, residents, scholars, and faculty
- Responsible officer for the J-1 Exchange Visitor Program and Training Program liaison to ECFMG
- Designated school official for the F-1 student visa program and Student and Exchange Visitor Information System (SEVIS)
- Advising concerning the admission of international students
- Advising regarding the hiring of international faculty and staff
- Consulting with current and potential students, residents, researchers and faculty regarding nonimmigrant and permanent resident issues
- Supervises the issuance of USCIS documents for F-1 students, J-1 Exchange Visitors and H-1B temporary workers to assure compliance with established governmental policies and procedures
- Consulting with academic and administrative offices regarding non-immigrant and permanent residence issues
- Orienting new students and scholars

The OIS is located in the Armour Academic Center, Room 984, telephone (312) 942-2030, and is available to serve the needs of international students, as well as other international visitors to the Medical Center. The office provides on-arrival information to visitors, help in preparing visa applications, immigration paperwork, and orientation on arrival. The director acts as the Training Program Liaison to the Educational Commission for Foreign Medical Graduates (ECFMG) and is the campus contact for the Fulbright Scholar Program. Rush students, faculty, or staff who plan to work or study abroad are asked to report these plans to OIS.

Library of Rush University

The Library serves the education, patient care and research needs of the students, faculty, staff, and patients at Rush University Medical Center. In addition to offering a comprehensive collection of traditional printed materials, the Library continues to expand its tremendous wealth of on-line electronic information resources. A complete overview of all Library services is available at www.lib.rush.edu/library.

The collection includes materials in a wide range of formats covering all areas of health sciences. RushCAT, the online catalog, shows all of the items available. Records include an item's location, circulation status, full bibliographic record, and links to web information such as full-text journals when applicable.

The Library's databases feature OvidWeb, a collection of medical resources such as MEDLINE, CINAHL (Nursing and Allied Health), PsycINFO (Psychology), four Evidence-based Medicine databases and more. Many of the citations found in OvidWeb link to the complete full-text of the original article. Other online resources include UpToDate and MD Consult. UpToDate offers concise topic reviews that provide practical answers to medical questions. MD Consult offers the full-text of a wide range of medical textbooks, an extensive drug information database and a list of clinical guidelines. For a complete list of all electronic resources, please visit the Database section of the home page at www.lib.rush.edu/servlets/EJournal/SearchEJournalDbase.

The fastest growing resource is the collection of full-text online electronic journals. Currently, over 1,200 titles are offered. Students may view a complete list of the electronic journal titles from the home page at E-Journals. Besides full-text journals, the library also offers many tables-of-contents of journals, helping users keep current in medical literature. For more information about the e-journals, or to view a list of the titles, please visit the electronic journal page at www.lib.rush.edu/servlets/EJournal/SearchEJournalHits.

If the library does not have an item, it can be ordered from another library. For a modest fee, library staff can locate, photocopy and deliver copies of journal articles to registered users from any library located throughout the world. Normal service time is ten business days; expidited service returns articles in approximately two business days. Books, proceedings, dissertations and audiovisual materials can also be ordered from other institutions, generally at no charge. Turn around time depends on the lender. Full details about interlibrary loan and document delivery services is available on the home page at www.lib.rush.edu/library/delivery.html.

The Library offers extensive support for distance education students (for details see www.lib.rush.edu/library/dised.html). The Electronic Reserves System (ERes) allows all students to access their required readings online directly from the Internet via the library's home page. Items may be read online or downloaded for future use. Most of the resources can be accessed from off campus. Please refer to the guide Electronic Access for details.

The students, faculty, and staff of Rush University and Medical Center may access restricted Library resources such as the full-text journals, and databases, from off campus by using a special com-

puter account called the Proxy. A Proxy account only works with an existing Internet service provider: students must have their own cable, DSL, or dial-up account first. For more information, please see the FAQ at www.lib.rush.edu/library/connect.html.

The Reference Department provides personalized information services to all members of the Rush community. They offer frequent workshops on using electronic information resources such as, Online Searching, Evidence-based Medicine, Bibliographic Software, and many others. Please see the workshop schedule at www.lib.rush.edu/library/workshop.html.

The Reference Department also sponsors InfoConsults: one-hour private consultations focused on the individual's specific needs and area of concentration. All workshops and consultations are free. Help is available in person, by telephone or e-mail at Lib_Ref@rush.edu.

For further information, please do not hesitate to contact the library at (312) 942-5952 or Lib_Ref@rush.edu.

McCormick Educational Technology Center

(www.rushu.rush.edu/metc)

The McCormick Educational Technology Center (METC), a department of the Library of Rush University, is a media and microcomputing center designed to facilitate independent study and self-enrichment through use of audiovisuals (AV) and computer software. One of the primary missions of the METC is to provide an AV and computer software collection for educational support to the University and Medical Center.

The METC houses a large collection of videocassettes, CD-ROMs, computer software, videodiscs, DVDs, slide/tape programs and audiocassettes, which are available for student, and faculty use. Students may request, in advance, media materials for use in course presentations.

Included at the METC are 13 group viewing rooms, a 40-workstation computer classroom, and a computer/AV lab which houses 45 computers (a mix of PC and Macintosh platforms), VHS player/monitors for individual use, two slide projector viewers and four scanning workstations. During hours of operation, AV viewing and computer aided instruction (CAI) software use has first priority over all other viewing room uses. (These viewing rooms may be used for group study purposes after the METC is closed.) All PC computers run Windows XP, XP Office 2003 (Word, Excel, PowerPoint and Access) and SPSS. Endnote, bibliographic management software, is available on select workstations. Room reservations may be made online at www.rushu.rush.edu/metc, in person at the METC circulation desk, or by calling (312) 942-6799.

The METC is a major Internet access point at the University, providing World Wide Web and e-mail access to all Rush University students. Students have access on a first-come, first-served basis to the computer lab 24 hours a day (with a valid Rush University I.D.). Computer diskettes, compact discs, transparencies and address labels are available for purchase. The department also offers Tablet PCs and laptop computers, portable electric typewriters, and audiocassette recorders to students for overnight loan.

Custom designed data collection research forms (e.g., surveys) may be requested upon consultation with METC staff. Staff will also assist students and faculty in locating commercially produced software and media for use within their courses.

More detailed information about the METC, and its resources and policies can be found at: www.rushu.rush.edu/metc

Office of Student Affairs

The mission of the Office of Student Affairs is to provide an atmosphere that will enhance students' academic experience. The Student Affairs staff works closely with students, faculty and the administration to identify student needs and to design and implement programs and policies to meet those needs. The professional staff serves as advisors to student organizations, provides career counseling and services to students in each academic discipline, assists with the development and implementation of orientation and commencement events, and sponsors educational, multicultural, recreational, and social activities for all students.

The Office of Student Affairs
600 S. Paulina Street, Suite 984 (Armour Academic Center)
Chicago, Illinois 60612
Office: (312) 942-6302
Fax: (312) 942-6995
E-mail: Student_Affairs.rushu@rush.edu
Web site address: www.rushu.rush.edu/studentlife

Clubs and Organizations. The Office of Student Affairs recognizes the interests and goals of each student organization through administrative and limited financial support. Students who wish to establish a new organization are encouraged to stop by the office and speak with a staff member. Currently, there are nearly 35 active organizations, including the American Medical Student Association, Graduate College Student Organization, National Student Speech-Language Hearing Association, Rush Muslim Students' Association, Student National Medical Association, Student Nurses Association, and the Student Occupational Therapy Association. A complete description of all the student organizations is listed in the student handbook, which is available from Student Affairs.

Student Activities. The Office of Student Affairs sponsors programs that are open to all Rush University students and faculty. The primary objective of these programs is to enhance the co-curricular life of the Rush student community. In the past, the office has sponsored events including Octoberfest (student organization fair), a student art fair, and monthly Friday evening socials known as T.G.I.F.'s. In addition, the office encourages student exploration of Chicago's many cultural, educational, and social resources by regularly offering discounted museum, theatre, sports, and movie tickets. The staff in the Office of Student Affairs welcomes input and assistance from students in the planning and implementation of programming events. If you wish to become involved, please contact the Office of Student Affairs, (312) 942-6302.

Career Development. The Office of Student Affairs assists students active in the job search and residency application process with resumes, curriculum vitae, cover letters, personal statements, job search strategies and interviewing techniques. A variety of career resources are available for student use, including

workbooks, handouts, guide books, and sample resumes and cover letters. Additionally, the Office of Student Affairs co-sponsors programs and workshops to acquaint students with a variety of educational and job opportunities. Biographical data and faculty recommendations are kept on file and sent out at the students' request. Many of these resources are also available on the web site at www.rushu.rush.edu/studentlife/career. Each student is also assigned an academic advisor. The advisor is knowledgeable about the student's educational program and provides assistance in curriculum selection, academic progression, and professional and career development. Within Rush Medical College, an Assistant Dean in the Office of Medical Student Programs has specific responsibility for providing counseling about specialty choice and application for post-graduate residency positions.

Lockers. At Orientation, the University will assign lockers for the storage of coats, books, and other miscellaneous articles. Be advised, however, that the Medical Center assumes no responsibility for the loss of personal property from lockers. If any difficulties with a locker arise, contact the Office of Student Affairs.

Mailboxes. Campus mail is delivered to student mailboxes located on the seventh floor (College of Medicine) of the Armour Academic Facility or in the Office of Student Affairs, Suite 984 (College of Nursing and Vascular Ultrasound Program). Since United States mail is not delivered to these mailboxes, arrangements should be made to have all personal mail sent to a local address. Students should check for mail daily as Rush University personnel distribute dated material through this campus system. Additionally, since students are held responsible for meeting deadlines announced in the dated material, those who will be off campus for an extended period of time should make arrangements to have a friend forward campus mail. Rush University nor the Office of Student Affairs is responsible for mail that accumulates during a student's absence. Students may obtain interoffice mail envelopes from the Office of Student Affairs.

Publications. The Office of Student Affairs oversees the publication of student related materials, such as the Student Handbook, the Student Housing Guide, and the New Student Picture Book. The New Student Picture Book may be accessed through the Rush University intranet at iris.rush.edu/RUSHU. A Student Handbook is provided to each new student during the Orientation program.

Recreation. Rush University students have the opportunity to utilize several recreation facilities in the area. Four outdoor tennis courts and a jogging track surrounding the tennis courts are available for student use. These are located on the corner of Ashland and Harrison Streets adjacent to the Atrium Pavilion. For students interested in aerobics classes, Employee Wellness sponsors classes during the noon hour and late afternoons. For a class schedule, fees and other information call (312) 942-2817. The Union Station Multiplex Fitness Center, an affiliate of Rush University Medical Center, offers reduced membership rates for students. This full service, state-of-the-art facility, located at the corner of Jackson and Canal Streets, includes a swimming pool, basketball courts, fitness classes, cardiovascular equipment, strength equipment and weights, private women's workout area, and a café/juice bar. Rush University students also have an opportunity to use two recreation facilities at the University of Illinois at Chicago. The Chicago Illini Sport and Fitness Center on the University of Illinois West Campus includes a gymnasium, pindoor running track, racquetball courts, exercise equipment and human performance center. The Sport and Fitness Center is located at 828 South Wolcott, lower level. Activities at the East campus include table tennis, swimming, billiards, racquetball, and universal weight machines. The recreation area is in the south wing of the Chicago Circle Center, 750 South Halsted. Students presenting a valid Rush University I.D. card at either the Union Station Multiplex or UIC Fitness Centers will be eligible for admission. Students purchasing passes may bring receipts to the Office of Student Affairs to receive a partial refund. Schedules listing the facilities, rates and hours of operation are also available. Questions regarding the above recreation facilities, can be directed to the Office of Student Affairs, (312) 942-6302.

Student Lounge. The Student Lounge, located on the ninth floor, north end, of the Armour Academic Center is equipped with couches, a wide screen television, an e-mail workstation, tables and chairs, a copy machine and complete kitchen (stove, refrigerator, and microwave). Group rooms are also available for student organizations to hold meetings, studying, special events, and other activities. All students are invited and encouraged to use the facilities of the lounge. A student I.D. card swipe mechanism allows students 24 hour access to the lounge.

Voter Registration. Voter registration materials are available through the Office of Student Affairs. This allows the ability to vote in local, state and federal elections.

Campus Housing

Information pertaining to on-campus housing, including the application process and/or roommate selection, may be obtained from the Associate Dean for Student Services, Suite 440, Armour Academic Center. Center Court Gardens, located on Harrison Street across from the Marriott Chicago Downtown at the Medical District, consists of apartment style living with over 245 units available as studios, one-bedrooms, and two-bedrooms. All apartments are unfurnished, carpeted, have individually controlled heating and air conditioning, modern appliances, and bathtubs with showers. Utilities and heating are not included in the rent.

Application Process. Students applying for admission to one of the academic programs at Rush University will be sent a housing application as part of the admission process. Applications for returning students are available from the Associate Dean for Student Services, 600 S. Paulina Street, Armour Academic Center, Suite 440, or via the web at www.rushu.rush.edu/studentlife. Because on-campus housing is in great demand, Rush University has established the following set of priorities for assigning students to available units. Students in category number one receive the highest priority followed by those in category number two, etc.

1. Returning undergraduate students who apply for on-campus housing by April 1st
2. Incoming undergraduate students who have been accepted for admission and apply for housing by May 1st
3. Incoming graduate and professional students who have been accepted for admission and apply for housing by May 1st
4. Returning graduate and professional students

These priorities will be used as a guide when assigning housing. Returning undergraduate students who fail to submit a housing application for the succeeding year by April 1st will loose their priority. Rush University reserves the right to make exceptions to these priorities when extenuating circumstances exist. Apartment types available:

Studio Apartment	One student
One Bedroom Apartment	One-two students
Two Bedroom Apartment	Two-four students

Notification of acceptance into University housing will be sent to each student assigned to on-campus housing. New students must receive an acceptance for admission before any housing notification will be sent. Entering students whose program of study begins in the summer quarter will be sent housing assignments the beginning of May. Students who begin their programs in the fall will receive housing assignments at the end of May. Returning students will receive their housing notifications in June.

Lease and Deposit. A lease is included with each letter of acceptance into University housing. The lease, accompanied by a security deposit of one month's rent, must be signed and returned. Failure to return the lease and the security deposit by the specified deadline will result in the loss of the housing assignment. Rent is payable in equal quarterly installments. Students are billed for rent along with tuition and fees prior to the beginning of each quarter.

Consolidation Policy. In an effort to maximize the number of on-campus housing spaces available to Rush University students, consolidation of tenants may occur. This consolidation policy will affect only those students who occupy an apartment by themselves that was originally leased to two or more students. Such a situation can occur when a roommate leaves University housing during the course of the academic year. If consolidation is necessary, students involved will be informed in writing. At that time the student will have the following options: share an apartment with another student in any building who is also in need of a roommate; find a Rush University student roommate of his/her choice; have a roommate assigned from the available applications or pay the full rent of the apartment.

If the fourth option is chosen, the apartment will become a single accommodation only through the end of the current lease. If the student wishes to renew the lease, the student will have the option of remaining in the apartment with the understanding that he/she will receive a roommate or will be given an opportunity to move to another available apartment.

Students should address questions concerning the application process, assignment process, or roommate selection to the Associate Dean for Student Services.

The Office of Student Affairs is available to assist students with their off-campus housing needs. Information regarding Chicago neighborhoods, local apartment listings transportation, Internet resources, and much more are available. Students are also encouraged to check bulletin boards throughout Armour Academic Center and in the Office of Student Affairs for apartment leads within walking distance to Rush, including the University Village/Little Italy neighborhoods. Before you begin your search, consider how much rent you can afford to pay, how far you are willing to commute to campus, and if you plan to live alone or with a roommate. Rush University accepts no responsibility for off-campus arrangements.


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Registration

Each quarter a printed Timetable of Courses is published by the Office of the Registrar for the subsequent quarter. The Timetable is also available through the Rush University web site at www.rushu.rush.edu/registrar. Classes are filled on a first-come, first-served basis according to the following order of priority: 1) continuing students, 2) new students and 3) unclassified students. It is the responsibility of continuing students (with the exception of medical students) to submit a completed registration form each quarter during the designated period for "continuing students" to avoid any late registration fee that may apply. Students must also clear any "holds" on their permission to register prior to registration for a particular quarter. Any continuing student registration that cannot be processed by the end of the "continuing" student registration period because of a "hold" will be assessed any late fees that may apply.

Registration Forms. Registration forms for all "continuing" students and "unclassified" students are available from the Office of the Registrar, Suite 440 Armour Academic Center, or at www.rushu.rush.edu/registrar

Credit Hours. Rush University is on the quarter system. Each quarter is at least ten weeks in length and an examination period is provided at the end of each quarter. Most classes give a final examination during this time. The quarter hour is the unit used by the College of Nursing, the College of Health Sciences and The Graduate College to determine credit for courses taken. As a general rule one quarter hour represents contact time of one lecture hour, two hours of small group discussion or three laboratory or clinical hours per week. Course credits are not calculated for Rush Medical College students. However, the number of weeks of clinical experiences appears on the transcript of the academic record.

Required Immunizations. The minimum requirements under The College Student Immunization Act of the State of Illinois are as follows: any student whose date-of-birth is January 1, 1957 or later must submit proof of immunization for: measles (two doses), mumps, rubella, diphtheria (primary series-two doses) and tetanus (adult booster less than 10 year old). Students having direct patient contact must have immunization for Hepatitis-B virus. Proof of immunizations are requested as part of the admission process and if not submitted before the registration period for the second quarter in residence, registration will be prohibited. Additionally, individual immunization requirements will vary by college or program and apply to all students in that program regardless of age. Students are required to comply or risk being barred from continuing.

Required Signatures. Registration forms are processed only if the required faculty signatures have been obtained. Registration for more than 16 credits for graduate nursing students or more than 17 hours for all others requires written permission from the program director. The nature of some course offerings may also require the instructor's signature.

Registration for Medical Students. Registration for pre-clinical studies is done administratively. Registration for clinical studies is done in the Office of Clinical Curriculum.

Confirmation of Registration. Students receive a "Student Data Sheet" as confirmation of registration. It includes the courses for which the student registered, billing, and financial aid information. Timetable changes are posted in the Office of the Registrar and on the web site. No message appears on the data sheet if the student did not get all requested courses.

Completion of Registration. Registration is complete only when tuition and other charges for the quarter are paid or satisfactory arrangements for payment are made. Registration for subsequent quarters is denied to students not cleared by the Bursar. Tuition is due on the first day of the quarter. (See Financial Affairs).

Late Registration Fee for Continuing Students. Following initial matriculation, several programs assess a late fee to students who fail to register during the designated registration period for "continuing" students. A registration is considered late if it is submitted to the Office of the Registrar after the posted deadline. If a student submits his/her registration prior to the deadline, but due to a registration hold it cannot be entered by the Office of the Registrar until after the deadline date, a late fee will be assessed. The following programs charge late registration fees:

College of Nursing - $50
Clinical Nutrition - $25
Health Systems Management - $100
Medical Physics - $50

Unclassified Students. Persons not admitted to a degree program but who want to enroll in a course may do so by completing the appropriate unclassified registration form. Separate forms are available for College of Nursing courses and for "non-nursing" courses. The College of Nursing Unclassified Registration form requires the signatures of an Associate Dean for approval to register. An instructor is not obligated to accept any unclassified student in his/her class, and students without appropriate background take courses at their own risk. The completed form must be submitted with tuition payment or it will not be processed. The Bursar will charge tuition at the rate applied to graduate students. However, neither instructor approval nor payment assures a place in the class because students in degree programs have priority for enrollment in all courses. Notification of registration is made by phone or e-mail. If an unclassified student cannot be accommodated in a class, a full refund of tuition will be mailed. A student may accumulate no more than 12 quarter hours of academic credit as an unclassified student. These 12 hours, equivalent to a full-time one quarter course load, may be taken in one quarter or over a period of time. Registration as an unclassified student that results in more than the maximum number of hours (12) can only be authorized by the dean (or his/her designate) of the college offering the course. Credit earned as an unclassified student will not necessarily apply toward a Rush degree if the unclassified student is subsequently admitted to a degree program. Any incomplete ("I") grade earned as an unclassified student will revert to a permanent "F" unless completed by the end of the next academic quarter. It is the student's responsibility to pursue the completion of an "I" grade.

Pass/No Pass Option. The timetable indicates all courses that may be taken pass/no pass. One may register to take a course pass/no pass simply by circling the P/N option on the registration form. A student deciding to take a course pass/no pass after having initially registered should complete a Pass/No Pass Option Form available in the Office of the Registrar. This form may require the

signature of the instructor as well as the advisor and must be submitted by the second Monday of the quarter. The form may also be used to revert to the letter grade option. All medical students are graded honors (H), high pass (HP) (for clinical courses in the 3rd and 4th year only), pass (P) or fail (F). Graduate students in nursing may take no more that 20 percent of their total graduate course credits under the pass/no pass option. Therefore, if a nursing student completes 55 quarter hours to earn a master's degree, he/she may earn no more than 11 hours pass/no pass; the student who graduates with 125 quarter hours may take no more than 25 hours pass/no pass. Thesis and dissertation hours (NSG 541, 591, 598, 691, and 699), which are only graded pass/no pass, are in addition to the 20 percent limit. Pre-candidacy research is graded P/N in The Graduate College. Divisional policies in The Graduate College vary on the pass/no pass grading of other courses.

Independent Study. To register for independent study, students complete the form on the back of the registration form. This form identifies the title of the study to be posted on the student's transcript, the preceptor's name and office location and the number of credits for the study. The advisor's signature is required on both the front and back of the registration form. Nursing students complete an Independent Study Contract Form, which is available in the Office of the Registrar. On this form the objectives of the study are defined, a plan to meet those objectives is described, etc. It should be completed and approved by the preceptor, department chairperson and the program director no later than the first day of the quarter in which the independent study is to be taken. The student's preceptor keeps the contract. Health Systems Management students must register on the back of the registration form and also complete a separate form available in the Health Systems Management office (1700 W. Van Buren Building, 1st floor).

Add/Drop. The only way to change course registration is to complete a Add/Drop Form available in the Office of the Registrar. The official date of the add/drop action is the date that the add/drop form is processed by the Office of the Registrar. A course dropped during the first week of the quarter will not appear on the student's transcript. After the first week one of the following policies applies:

Course Dropped in Weeks 2-5: Grade of W
Course Dropped in Weeks 6-End: Grade of WP, WF or WN

No course may be dropped after the last day of classes. No withdrawals are allowed during the final examination period. Students must obtain the appropriate advisor's signature before the form will be processed. Forms that do not have an advisor's signature will be returned to the student. Medical students wishing to change their clinical schedules must contact the Assistant Dean for Clinical Curriculum at least four weeks before the start of the scheduled clerkship.

Auditing a Course. With the permission of the program director, students wishing to attend a course without completing all the requirements for credit may register to audit the course. The program director is under no obligation to allow a person to audit and will not allow taking of course examinations. Auditing students are prohibited from being in class when examinations are scheduled. An auditor may participate in class discussion only at the invitation of the course director. Auditing of laboratory or clinical course is prohibited. If space in a class is limited, continuing and new students have priority. An audited course will appear on the student's transcript with the designation of "AU." Attendance in an audited course is expected. If the student does not attend class, a grade of "W" will be assigned. No grade points or credit hours are granted for audited courses. Registration in a course cannot be changed from audit to credit or credit to audit after the first week of the quarter. Dependent on college policy, students who have audited a course may not apply for credit at a later time. Earning a grade and receiving credit for the course can only occur by enrolling in and paying for the course during the term it is offered. However, an audited course may be taken for credit in a later quarter by registering and paying for the course.

Student Identification Card

Identification Card. Each student receives an identification card at matriculation. When on campus Rush students are required to wear their ID card in an easily visible location. For reasons of security, employees or students not wearing valid identification could be asked to leave the University/Medical Center facilities. A valid ID card is needed to use the library, labs, bookstore, and for admission to some school events. Lost or stolen identification cards should be reported as soon as possible. They may be replaced at the Office of the Registrar from 11:30 a.m. - 4:00 p.m. daily. There is a $5.00 fee for this service.

Rush E-mail

Rush University assigns each student an e-mail account at the beginning of the student's first quarter of enrollment. Students are expected to check their e-mail account with regular frequency since Rush University considers e-mail an official means of communication. Often, students are notified of important news and deadlines (such as financial aid, registration and graduation information) via the campus e-mail system. If you experience problems with your e-mail account, please contact the Help Desk at (312) 942-4357 or via e-mail at help@rush.edu. For more information on the Rush University e-mail usage policy, please review the following information: www.rushu.rush.edu/metc/elecmail.html.

Veteran's Benefits

If you are a veteran of the Army, Navy, Marines or Coast Guard (or in active Reserves) and are eligible for education benefits through the Department of Veterans Affairs (VA), please contact the Office of the Registrar. The Registrar can help facilitate the processing of forms with the VA to "certify" that you are admitted and enrolled in a program of study at Rush University. Many questions can be answered on the VA's Education Benefits page: www.gibill.va.gov.

Off-Campus Enrollment

With college approval a student may take courses offered by another college or university that will apply toward his/her Rush degree. These courses are taken as integral parts of the student's curriculum, either replacing required Rush courses or fulfilling special or disciplinary objectives. Prior to registration at the other institution, the student must complete a Petition for Transfer of Credit form to ensure the transferability of the course. The student

is solely responsible for obtaining admission and registration information from the institution he/she wishes to attend and for meeting deadlines set by that institution for admission and enrollment. If the student is not enrolled for courses at Rush during the period in which he/she takes courses off campus, he/she must process a petition for a formal leave of absence. Students who will be simultaneously enrolled for courses at Rush should check with the Office of Student Financial Aid regarding the impact of taking hours split between two institutions on their aid. When the course is completed, the student must order an official transcript to be sent to the Office of the Registrar. Only upon review for an acceptable grade and compliance with any conditions outlined in the Petition for Transfer of Credit approval will the course be recorded on the Rush transcript.

Withdrawal and Leave of Absence

After matriculation to Rush University a student may not arbitrarily cease registration without notice. For both Withdrawal and Leave of Absence, a Petition for Clearance is required. Graduate students, in particular, are required by individual college's programs to maintain continuous enrollment or risk administrative withdrawal due to unexplained non-registration.

Withdrawal Procedure. Withdrawal implies the permanent departure from the University without the immediate expectation of return. Graduate and undergraduate students withdrawing from the University must give formal notification by completing a Petition for Clearance form, which requires them to obtain the signatures of specific University offices. Students may obtain the Petition for Clearance form from the Office of the Registrar, except for Nursing students, who should obtain the Clearance form specific to the College of Nursing. No withdrawals are allowed during the final examination period. Refunds are made only during the limits for refunds. Withdrawal is not allowed after the last class day of the quarter. (See Financial Affairs section.)

Leave of Absence Procedure. A Leave of Absence (LOA) is a temporary suspension of studies for which an approved time limit has been set and a specific date of return established. Leave of Absences are approved and granted at the discretion of the student's college. The procedure for petitioning for a Leave of Absence requires the student to complete the Petition for Clearance form and obtain all appropriate signatures. The completion of the Petition for Clearance makes the student eligible for a leave that is granted by the College. It is the student's responsibility to communicate directly with his/her College regarding the disposition of the request for the leave. Normally, a petition for a Leave of Absence will only be accepted through the first week of the quarter for which the leave is desired. The clearance procedure assures that students do not obligate themselves for additional tuition, financial aid, and insurance. Insurance may be continued under certain conditions. Failure to complete the Petition for Clearance form will make the student ineligible for any refunds and obligate them for full quarter insurance charges.

Academic Records and Policies

Grade Point Average. The grade report and the transcript of the academic record shows a Grade Point Average (GPA) for each quarter in which grade points were earned and shows a cumulative GPA for all work taken at Rush. The GPA is computed by dividing the number of earned grade points by the number of quarter hours of credit attempted for those courses. When a course is repeated only the second grade is computed in the GPA. No grade points are assigned for work taken on a pass/no pass basis and, therefore, are not computed in the grade point average. Grade point averages are not included for students in Rush Medical College since all courses are taken on an honors/pass/fail system.

Repeated Courses. Some courses, such as research and clinical courses, may be repeated. These are usually indicated in the course description or the Timetable of Courses. All grades and grade points are counted in the grade point average for these courses. For all other courses that are repeated, only the last grade is counted in the grade point average. Both the original course and the repeated course appear on the academic record and transcript.

Repeated Courses (Rush Medical College). The official transcript displays the first time a repeated course is taken until the grade is replaced at which time only the repetition and new grade are displayed. Both the original course and its repetition are recorded on the academic record for internal use within the medical college. Since all courses are taken H,HP,P,F the GPA is unaffected.

Grade Report. A quarterly grade report is mailed to each student's local address after grades have been recorded. Grades are usually mailed within five working days of the end of the examination period. Grade results are not given by telephone nor is personal pick up by the student permitted. A copy of the grade report is given to advisors. Grades are never released to parents, legal guardians, or spouses. The grade report is the student's copy only, and should not be accepted by an institution in lieu of an official transcript.

Academic Record. The permanent academic record is the student's official transcript, which includes all courses taken at Rush. External transcripts for medical students reflect the highest grade reported for each course at the time a transcript is requested. This record is maintained permanently in the Office of the Registrar.

Grading System

Grade	Points	Description
A	4.0	Excellent
B	3.0	Good
C	2.0	Satisfactory for undergraduates but may not be acceptable at graduate level
D	1.0	Minimal pass for some undergraduate programs. May not be acceptable at the graduate level. Not used at the graduate level by the College of Nursing, The Graduate College, or the Department of Health Systems Management
F	0	Failure
P	0	Passing
HP	0	High Pass - used by Rush Medical College only for 3rd and 4th year clinical courses
N	0	No Pass
H	0	Honors - Rush Medical College only
W	0	Withdrawal prior to midterm
WP	0	Withdrawal passing at midterm
WF/WN	0	Withdrawal failing or not passing after midterm
K	0	Credit earned through proficiency examination
NR	0	Grade not reported by instructor
I	0	Incomplete
CC	0	Course continues into the next quarter. Grade received at end of series is grade for entire course
AU	0	Audit
XX	0	Participation in an ungraded course or residency

Transcript Requests. Copies of the academic record may be obtained at no cost to the student or former student. These transcripts are released only with prior written consent of the student. Students may complete a Transcript Request form or write to the Office of the Registrar, Rush University, 600 S. Paulina Street, Suite 440, Chicago, Illinois 60612. Fax requests are honored at (312) 942-2219. The letter or fax must include a handwritten signature of the student. Transcripts will not be released if the student has an outstanding financial obligation to the University. Two working days should normally be allowed for processing. Transcript requests by medical students to be used in support of residency applications should be made to the Office of Clinical Curriculum of Rush Medical College rather than to the Office of the Registrar. A "dean's letter" is included with these requests. Copies issued to students will be stamped in red ink "Issued to Student." All copies bear the signature of the Registrar or his/her designate and the seal of Rush University Medical Center.

Incomplete Grades. Students receiving grades of incomplete ("I") must enroll during the subsequent quarter to complete course requirements. A change of grade cannot occur unless the student is enrolled. Students enrolling only to complete requirements for a course in which a grade of "I" was given must register for the "Continuous Enrollment" fee for zero credit hours. Refer to individual programs and the Financial Affairs section for specific "I" grade policies.

Graduation

Application for Graduation. No later than the second week of the quarter in which a student expects to graduate, all degree candidates must submit a completed Intent to Graduate form to the Office of the Registrar.

Graduation Requirements (See program descriptions for specific requirements). All graduate, doctoral, and B.S.N. completion students are required to submit a Degree Approval form to the Office of the Registrar after completing all academic requirements (including dissertation defense and submission of the dissertation to the library for microfilming). Doctoral candidates may not participate in the commencement ceremony before submitting this form.

Dissertation and Thesis. Some master's programs require a thesis to meet degree requirements. D.N.Sc. and Ph.D. candidates must complete a dissertation. Both are developed through faculty-guided independent research projects. Review of a thesis or dissertation will follow the sequence of steps as described by each college including the prescribed preparation manual for each degree. Copies of these manuals are available in each graduate division and in the University library. Each thesis/dissertation must be original and cannot have been used to meet the requirement of any other degree, either at Rush University or any other university. Each student will have a committee whose role is to assure that the student's thesis/dissertation is of high quality and meets the standards of the program and the University for originality, contribution to the field and scholarly presentation. The committee also assures that the student is making satisfactory progress toward completion of the dissertation. At or near the completion of the thesis/dissertation, each student will share with the academic community at large the knowledge developed via a public presentation. Two weeks prior to the presentation of the dissertation, a student is responsible for posting announcements on institutional bulletin boards regarding the presentation. The announcement must contain the title of the dissertation, the student's name, the location, and date of the presentation. The public presentation must precede the final approval of the thesis or dissertation by the Thesis/Dissertation Committee. A copy of the thesis/dissertation must be approved by the Director of the Rush University Library, microfilmed by University Microfilms International, and a copy must be bound for permanent cataloging in the library. Ph.D. and D.N.Sc. must complete all requirements for the degree pertaining to the dissertation including its defense prior to May 15th to remain eligible for participation in commencement.

Commencement ceremony. Rush University commencement is held once a year at the end of the spring quarter. The exact date for commencement is published in the academic calendar appearing in the Timetable of Courses, in the Rush University Bulletin and on the Office of the Registrar web site. Students will be notified by the Office of Student Affairs concerning participation in the event. Students are expected to march in commencement exercises. Most students who complete all requirements for the degree by the end of the summer quarter are eligible to participate in the commencement ceremony the preceding June. Doctoral candidates normally must have degree requirements completed by May 15th to participate in the June ceremony. Exceptions must be approved in writing by the appropriate college dean and communicated to the Office of the Registrar. Additional information regarding degree requirements, deadlines and eligibility to participate may be obtained from program directors. Students whose academic plans change, making them ineligible to participate in the June ceremony, will be deleted from the commencement list for that year. However, they are then eligible to participate the following June should they successfully meet degree requirements. During the ceremony, diplomas are given to students who have completed their programs, discharged their financial obligations to the Medical Center, and returned all library books and other University property. Students will be notified of all outstanding obligations, and the Office of the Registrar will encumber the diplomas and transcripts of students until these obligations are met.

Awarding of Degrees. Typically, Rush University degrees are dated the Saturday of finals week during the quarter in which all degree requirements are completed. When degree requirements are met during the break following a quarter, the degree will be dated the end of the subsequent quarter. Degree requirements include all curricular and other program prerequisites, such as required courses, residency, minimum grade point average, cumulative quarter hours, etc. Before a degree may be granted, all grades of incomplete (I) must convert to final grades. Outstanding financial and other Medical Center obligations have no effect on the awarding of degrees; however, the diploma, student transcript and other notification of a degree awarded will be withheld until these obligations have been met.

Graduation Honors. Candidates for the bachelor of science degree who have demonstrated academic excellence are honored at commencement by the Rush University faculty. Those earning a 3.4 or better grade point average based on six quarters at Rush are awarded the bachelor of science cum laude; those with 3.6 or better, magna cum laude; those with 3.8 or better, summa cum laude. Only Rush University courses are calculated into the grade point average. Honors appear on the student's diploma, transcript, and are announced during the commencement ceremony.

Dual Degree. (Undergraduates in nursing and clinical laboratory science) Some affiliated colleges award a bachelor's degree to students who have transferred to Rush University. Students receive the degree after they have met degree requirements of the affiliated college. Often those requirements have been modified slightly to accommodate the unique nature of the affiliated-Rush program. Questions regarding degree requirements and eligibility should be directed to the Registrar's office of the affiliated college. To receive a degree from the affiliated college, each student must authorize the Office of the Registrar of Rush University to send an official transcript of Rush courses to the affiliated college.

Prizes and Awards. Most of the following prizes and awards are given annually at college/departmental ceremonies in June immediately before the Rush University Commencement.

College of Health Sciences

The Theda L. Ashley Memorial Award to the graduate student who has demonstrated outstanding achievement in food systems management

The Clinical Recognition Award in Clinical Laboratory Sciences to the graduating student who exhibits outstanding professional qualities in clinical rotation

College of Health Sciences Dean's Award to an undergraduate and a graduate student for outstanding academic achievement

The College of Health Sciences Faculty Scholarship to a student enrolled in a program within the College of Health Sciences for all-around excellence

The Department Chairman's Award for Clinical Laboratory Sciences to the student who has demonstrated the highest degree of professional qualities and values

The Communication Disorders and Sciences Awards to the outstanding graduate students in audiology and in speech-language pathology as selected by the faculty

The E. Virginia Pinney Award, endowed in 1985, is given to the graduate student who has demonstrated outstanding leadership potential in the profession of dietetics

The Health Systems Management Award to the outstanding graduate student as selected by the faculty of the Department of Health Systems Management

The Health Systems Management Alumni Award given by the HSM Alumni Association to the outstanding master's project presented by a graduating student

The Occupational Therapy Faculty Award to the outstanding graduate student who has demonstrated a balance of scholarship, humanitarianism, integrity and professional commitment as selected by the faculty

The Joseph A. Thomas Award for Clinical Excellence to the outstanding Occupational Therapy graduate student who has demonstrated patience, clinical excellence, and an interest in stroke rehabilitation

College of Nursing

The College of Nursing Dean's Award for superior academic achievement

College of Nursing Teaching Excellence Award to the outstanding faculty members as selected by the graduating students and as selected by the faculty

The Dianne Nora Clinical Excellence Award to the master's student who has demonstrated outstanding performance in clinical nursing courses

The Excellence in Adult Health Nursing Award to the prelicensure student for achievement in academic and clinical endeavors

The Excellence in Gerontological Nursing Award to the prelicensure student for who has demonstrated excellence in gerontological nursing

The Excellence in Maternal Child Nursing Award to the prelicensure student who has demonstrated excellence in maternal child nursing

The Freeland Scholarships for prelicensure nursing students who have demonstrated outstanding academic and clinical performance

The Gerontological Nursing Award to the undergraduate student who has demonstrated excellence in gerontological nursing

Golden Lamp Society Award to the outstanding doctor of nursing science student for research and scholarship

The J.W. and Agnes von Brimer Award to the academically outstanding prelicensure student

The June Polich Memorial Award for nursing excellence of a baccalaureate nurse in memory of June Katheryn Polich, a 1957 graduate of Presbyterian Hospital School of Nursing

The Kristen Kowalski Excellence in Maternal Child Nursing Award recognizes a graduating prelicensure student who exemplifies the outstanding nursing care of children and families

The Kellogg Scholarship Award to Doctor of Nursing Science Student for superior academic achievement

The Linda L. Clemmings Award for outstanding performance in the community/family nurse practitioner program

The Luther Christman Award from the Nursing Alumni Association to the prelicensure nursing student moving directly into postbaccalaureate studies who has demonstrated outstanding academic and clinical performance and leadership

The Mary S. Oakley Gerontological Nursing Research Award for academic excellence and outstanding research

The Nursing Alumnae Clinical Excellence Award to the prelicensure nursing student who has consistently demonstrated outstanding clinical performance

Professional Service Awards to nursing students for significant contributions in the areas of community service and/or the professional nursing community

The Rush-Presbyterian-St. Luke's Nurses Alumni Association Awards for outstanding graduating nursing students who demonstrate academic and clinical excellence

The Ruth E. Schmidt Endowment Fund for Nursing Education Award to the registered nurse completing the baccalaureate degree who has demonstrated potential for significant contributions to the profession of nursing

Sigma Theta Tau - The National Honor Society for Nursing - Gamma Phi Chapter membership is extended to undergraduate and graduate students who demonstrate outstanding academic achievement, leadership qualities, and commitment to the ideals and purposes of the profession.

Writing Award for nursing students who have demonstrated outstanding scholarly and/or creative writing

Rush Medical College

The Aesculapius Award to the outstanding resident physician as voted by the medical students

Alpha Omega Alpha Honor Medical Society. Undergraduate membership is extended to medical students who give promise of becoming leaders in the field of medicine

The American Medical Women's Association Scholarship and Achievement Citations honoring women in the graduating class of Rush Medical College for outstanding scholarship and achievement

The Anthony J. Schmidt, Ph.D., Prize in Anatomical Sciences to the senior student who had an outstanding performance in the anatomical sciences courses

The Arthur Dean Bevan Award to the graduating medical student who has demonstrated clinical and academic achievement in surgery

The Cardiology Prize to the graduating medical student who has had the best performance in a cardiology elective course

The Daniel Brainard Award to the outstanding teacher in the basic sciences as voted by the medical students

The Daniel Welsh, M.D., Memorial Scholarship to a student who pursues a general surgery residency

The David Jones Peck Prize to the student who has made the greatest contribution to the Student National Medical Association

The Dayton Ballis Humanities Fellowship to a Rush Medical College student for academic excellence in the humanities related to medicine

The Department of Family Medicine Award to the graduating student who has demonstrated academic excellence in family medicine

The Department of Pediatrics Award to the graduating student who has demonstrated outstanding achievement in pediatrics

The Edward J. Eckenfels Award in Social and Community Medicine was established in 1998 in honor of the past director and founder of the Rush Community Services Initiatives program.

The Erich E. Brueschke, M.D., Award in Family Medicine to the graduating student who has demonstrated excellence in family medicine

The GATE Pharmaceuticals' Outstanding Student Award to the graduating medical student who has excelled in the study of obstetrics/gynecology by demonstrating excellence in scholarship and concern for patients

The Harvey H. Grodzin, M.D. Memorial Pediatric Scholar ship established by Dr. Grodzin's family and friends given to a graduating medical student who has demonstrated excellence and who is embarking on a residency in pediatrics

The Henry M. Lyman Memorial Prize, endowed in 1908, is given each year to a junior medical student for outstanding work as voted by the faculty.

The James A. Schoenberger Prize in Preventive Medicine for outstanding academic work in disease prevention and health promotion

The James B. Herrick Internal Medicine Award to the graduating student who has demonstrated outstanding achievement in internal medicine

The James G. Clark, M.D./Ruth E. Schmidt, R.N., Endowment Fund for Medical Education Scholarship established by Miss Schmidt, a graduate of the Presbyterian Hospital School of Nursing in honor of her physician, Dr. James G. Clark, this scholarship recognizes students of Rush Medical College who have demonstrated clinical and academic excellence

The Janet M. Glasgow Memorial Award of the American Medical Women's Association to the female student who graduates first in her class

The John Giles Prize for outstanding undergraduate work in epidemiology and public health as selected by the Department of Preventive Medicine

The Maynard M. Cohen Award to the medical student who has demonstrated excellent achievement in neuroscience research

The Nathan M. Freer Prize, endowed in 1892, is given to the outstanding senior medical student as voted by the faculty

The Nephrology Award from the Muehrcke Family Foundation to the medical student who has demonstrated outstanding achievement in the field of nephrology

The Paul E. Carson Pharmacology Award to the student who has demonstrated excellence in pharmacology

The Phoenix Award to the outstanding physician-teacher as voted by the medical students

The Rush-Presbyterian-St. Luke's Medical Staff Prize for Clinical Excellence awarded to the outstanding senior medical student as selected by the medical staff

The Samuel G. Taylor III Prize to the graduating student who has demonstrated excellent achievement in medical oncology

The Sir William Osler Pathology Prize to the medical student who has demonstrated outstanding achievement in diagnostic or experimental pathology

The Society for Academic Emergency Medicine Award to the student who has demonstrated outstanding proficiency in emergency medicine as selected by the faculty

The Graduate College

The Excellence in Research Award for excellence in research among students enrolled in The Graduate College

The Dean's Award for Student Leadership and Service recognizes a graduating student who, through his/her performance and behavior, demonstrates the qualities of excellence that The Graduate College seeks to develop in its students.

The Graduate College Faculty Award to the outstanding teacher on the faculty as selected by the students

Sigma Xi Outstanding Student Research Award. The local chapter of Sigma Xi, the National Research Society, sponsors Rush University Research week annually. The outstanding student research presentations are recognized by the Society.

Student Records

Name and Address Change. The Office of the Registrar maintains the current official listing of student names and addresses for Rush University. It is the responsibility of the student to keep the Office of the Registrar informed of changes in this information. A name/address change form is available in the Office of the Registrar. This change is made on the University Information System.

Directory Information Policy. Certain information classified by Rush University as directory information may be disclosed to the public. These are the directory information items: student's full name, local address and phone number, date and place of birth, home town, major field of study, year in school or class, participation in officially recognized activities, dates of attendance, degrees and awards received, previous educational institutions attended, previous majors, previous degrees and dates earned. Each quarter the Rush University Student Address Book is made available online for student, faculty, and staff use. It contains student names, local addresses and phone numbers, the student's college and classification. At the time of commencement exercises the following information may be released in public announcements: student's full name, degree and major, previous institution and degree(s), and hometown. Students may restrict the release of any item of information considered as directory information on a form provided in the Office of the Registrar, Armour Academic Center, Suite 440, by Friday of the first week of classes in each quarter.

Student Records Policy. The Family Educational Rights and Privacy Act of 1974 (FERPA) protects the privacy of current and former students enrolled in most educational institutions. Rush University has eight official student records. A student or former student may inspect and review these records by making an appointment with the appropriate office. The records and their locations are as follows:

- **Official Academic Transcript.** Office of the Registrar, Armour Academic Center, Suite 440.

- **Registrar's Files contain:** admission application, transcripts from other schools, immunization record, and registration information.

- **Rush Medical College Dean's Files contains:** grade reports, written evaluations of clinical work, curricular flow charts, copies of correspondence and of most material contained in the Registrar's file. Office of Medical Student Programs, Armour Academic Center, Suite 524.

- **College of Nursing Dean's File contains:** written evaluations of clinical work, curricular flow charts, grade reports. Office of the Dean, Armour Academic Center, Suite 1080.

- **Departmental files contain:** written evaluation of clinical work, curricular flow charts, and grade report copies.

  Clinical Laboratory Science
  Clinical Nutrition
  Communication Disorders and Sciences
  Health Systems Management
  Medical Physics
  Occupational Therapy
  Religion, Health and Human Values
  The Graduate College Admissions Office

  These offices are located in the Armour Academic Center, with the exception of Health Systems Management, which is located in the 1700 W. Van Buren building and The Graduate College, located in the Robert H. and Teri Cohn Research Building, 1735 W. Harrison St.

- **Financial Affairs files contain:** records showing all billing and payments, notes, correspondence dealing with a student's finances. Office of Student Financial Affairs, Armour Academic Center, Suite 440.

- **Financial Aid files contain:** all information concerning financial aid for the student. Office of Student Financial Aid, Armour Academic Center, Suite 440.

- **Placement Recommendations:** letters of recommendation filed by faculty members at the request of the student. Office of Student Affairs, Armour Academic Center, Suite 984.

Students may obtain copies of transcripts from the institution that holds the original records. Other portions of their records will be copied upon request. The request must be in writing and signed, must specifically identify the record desired and include the student's major, year, date of birth, and Social Security number. There is no charge for copies of the student transcript. Other reproductions cost 50 cents per page. The University honors requests providing there is no outstanding obligation to the Medical Center. Students within commuting distance may be asked to review the desired data in person. Students may request that the University amend information in their records they believe to be inaccurate, misleading, or in violation of their privacy. If the University refuses to amend a record, the student may request a hearing to challenge that decision. A hearing will be granted. Students may place in their educational records comments upon information in the records and/or state their grievances with a decision not to amend the record. Administrators who maintain the records adhere to a policy of limited access to administrators and faculty of Rush University who have a need for information in order for their offices to function, to determine academic progress, or to designate award recipients. Other persons or organizations given access are those responsible for accrediting the institution, for providing the student with financial aid, for complying with a judicial court order, and for protecting the health or safety of students during an emergency. Disclosure of any student's record to others not listed in these policies must have prior written consent of the student. Requests for information and letters of consent are kept with the records.

Tuition and Fees

Tuition and fees for the 2004-2005 academic year are listed below. For estimates of other expenses, see the Rush University Student Financial Aid Handbook.

Medical students are charged for a maximum of four years of full time tuition. Students needing additional quarters to complete degree requirements will be charged the enrollment fee (see fees below). Although it may be possible for a medical student to complete all degree requirements prior to the spring quarter of his/her fourth year, the spring tuition charge must be paid for a total of fourteen quarters of full-time tuition.

Tutition Charges by College Per Quarter

Full-time	Part-time	
College of Nursing		
$5,616	$486	Undergraduate Program (7 quarter program)
$6,696	N/A	Undergraduate Program (4 quarter program)
$6,013	$529	Graduate Programs
The Graduate College		
$3,660	$305	
College of Health Sciences		
Undergraduate Level Programs		
$4,337	$385	Clinical Laboratory Sciences
$5,408	$450	Perfusion Technology
$4,500	$398	Vascular Ultrasound
Graduate Level Programs		
$5,280	$460	Audiology
$5,106	$447	Clinical Laboratory Sciences
$5,400	$500	Clinical Nutrition (FT = 11 hours)
$4,725	$420	Health Care Ethics (M.A. program)
$6,157	$536	Health Systems Management
$5,187	$462	Medical Physics
$5,000	$440	Occupational Therapy
$5,180	$450	Speech-Language Pathology
Certificate Program		
$1,200 per course Health Care Ethics (via Web)		
Rush Medical College*		
$36,702		First Year ($12,234 per 3 quarters)
$34,470		Second Year ($11,490 per 3 quarters)
$34,470		Third and Fourth Years ($8,617 per 4 quarters)
Unclassified Students**		
See part-time rates listed above.		

*Rates are effective Fall 2004 through Summer 2005, except Rush Medical College students for whom rates are effective July 2004 through June 2005.

**Unclassified students enrolling in undergraduate-level nursing courses are charged at the graduate nursing part-time rate.

Definitions: **Full-time** = 12+ hours per quarter

Part-time = 1-11 hours (per hour charge shown)

Continuous Enrollment Fee. Students enrolled in a non-credit residency or academic enrichment program prior to receipt of their degree, must be registered for "Continuous Enrollment Fee" in order to retain their student status. Any degree/certificate student not taking courses but needing to replace an outstanding incomplete grade, must register for "Continuous Enrollment Fee" until the grade is satisfied. The Continuous Enrollment Fee is $300. This fee also applies to graduate students who have completed all courses but have not had the dissertation accepted. Hospitalization or physician fees are not covered in this fee.

Late Registration Fee. Students registering after the posted registration period each quarter may incur a late registration fee. This is imposed after initial matriculation in a degree program. Current charges are $25 for Clinical Nutrition students; $50 for Medical Physics or College of Nursing students; $100 for Health Systems Management students.

Application Fee. A non-refundable application fee is required of all applicants to offset the expense of processing the application, evaluating credentials, and maintaining a library of evaluation aids. This fee does not apply to any other charges such as tuition.

Enrollment Deposit. A $150 enrollment deposit is required of health systems management students and $100 is required for medical students prior to matriculation. All nursing students (including affiliated students) must deposit $75 prior to matriculation. Other health sciences students submit a $50 deposit. This holds a place in the entering class. This deposit is non-refundable and applies toward payment of the first quarter tuition.

Microscope Charges. Students enrolled in clinical laboratory science, microbiology, anatomy, and pathology courses must have microscopes. Third year clinical laboratory science students may rent microscopes for $125 per year for the entire two-year period. These fees will be included in the fall quarter bills. Any student who withdraws from the University or obtains a microscope from another source should notify the coordinator of General Educational Resources who will authorize the bursar to prorate monthly the rental fee or return the deposit if returned in good order. (See General Educational Resources in Campus Section.)

Returned Checks. If a student gives the University a check that is returned by the bank upon which it was drawn, marked "not sufficient funds," "payment stopped," or "account closed," a $25 charge will be assessed for each occurrence.

Payment of Fees

The following statement represents the payment policy for all Rush University students: Payment for tuition, fees and on-campus housing or satisfactory arrangements for payment must be made with the Office of Student Financial Affairs before registration is complete. Students may not attend classes until after registration is complete. Any exception to this policy must be approved in writing by the Vice President for Academic Resources.

Students have the responsibility to complete one or a combination of the following courses of action on or before the announced first day of classes each quarter:

1. Pay total tuition, fees, and on-campus housing charges for the quarter requires that one-third tuition, all fees, and a $15 service charge be paid on or before the first week of class. Additional payments of one-third are due on the fourth and eighth Mondays of the quarter. Contract forms are available in the Office of Student Financial Affairs.
2. Complete a Deferred Payment Plan Contract. This plan requires that one-third tuition, all fees, and a $15 service charge be paid on or before the first week of class. Additional payments of one-third are due on the fourth and eighth Mondays of the quarter. Contract forms are available in the Office of Student Financial Affairs.
3. Use the pending financial aid payment option. All students who have financial aid pending will be allowed to defer payment of that portion of tuition and fees that is covered by the anticipated aid. In order to use this option, students must have taken all steps required of them to apply for the aid (e.g., the application for a guaranteed student loan program must have been completed and submitted to the Financial Aid office). In order to avoid a late fee charge, students must make arrangements for payments of that portion of tuition and fees not covered with pending aid by completing steps one or two above.

Those students who have not made satisfactory arrangements will be given notice by mail during the third week of classes that they are delinquent in their financial obligations to the University. The notification will inform the students that they have until Friday of the fourth week of classes to satisfy all such financial obligations. On Monday of the fifth week of classes, those students who have not made satisfactory arrangements will be charged a $100 late payment fee. At the end of the quarter, those students who still have outstanding balances with the University that are not covered by pending financial aid will not receive grades or transcripts; will be dismissed from on-campus student housing; will lose all University privileges and will have their registration canceled for the following quarter.

Third Party Billing

All unpaid accounts are billed to the student monthly. If the student will not be personally paying the account, it is his/her responsibility for forwarding any bills to the appropriate party as soon as possible. It is recommended that a student in this situation authorize the Bursar to bill his/her parents, spouse, or other agent directly. Third Party Billing forms for this purpose are available in the Office of Student Financial Affairs, Armour Academic Center, Suite 440.

Refund Policy

Official withdrawal or dismissal from a course or from the University entitles a student to a refund of tuition according to the following schedule. No fees are refundable. A student may receive a 100 percent refund if withdrawal occurs during the first calendar week in which the quarter begins. Otherwise, refunds will be made as follows:

Second week	80% refund
Third week	60% refund
Fourth week	40% refund
Fifth week	20% refund
After fifth week	no refund

Students attending Rush for the first time who withdraw during their first quarter are entitled to a pro-rata refund of tuition and fees through the sixth week of attendance. Refunds will be shown as credits on the student's account unless the student requests a check for the amount of refund, less any amount still owed for other charges. Normally, checks are processed within two weeks. Students are not notified when the check is available in the Office of Student Financial Affairs. Students wishing to appeal the published schedule of refunds must appeal in writing to: Associate Dean, Student Services, 600 South Paulina Street, Suite 440, Chicago, Illinois 60612.

Student Health Services Program

Rush University requires students to be covered by a health plan in order to promote health and well being while protecting the individual from undue financial hardship that a medical emergency could cause. To that end students enrolled in degree programs are eligible for the Student Health Insurance Plan offered by Collegiate Risk Management, Inc. and People's Benefit Life Insurance Company unless they show proof of coverage under a similar plan. For the 2004-2005 school year the cost of the plan is $154 per month for single coverage, $333 per month for two people, and $433 per month for family coverage. This plan allows students to choose a primary care physician from a large list of members of the Preferred Provider Plan (PPO) in the Greater Chicago area. Provider listings, including a listing of preferred care pharmacies, can be found at www.ccnusa.com. There is an annual deductible of $150 and coverage of 90% for most patient services including hospitalization and surgery, as well as outpatient services such as office visits, mammography, laboratory and x-ray. A $15 co-pay for generic and $25 co-pay for brand name prescription benefits are included. Details of the plan are available in the Office of Student Financial Affairs, Suite 440, Armour Academic Center.

As a pilot program for the university, a small portion of fees for medical students has been allocated to a new Medical Student Health Service Program, supported by Lifetime Medical Associates (1645 W. Jackson, Suite 215). The Medical Student Health Service Program is designed to work seamlessly with Rush University Health Insurance to provide medical students with acute care. By using Rush University Health Insurance, medical students should experience an enhanced level of service and minimal billing problems, with a $10 fee per office visit. This will provide the type of "Student Health Service" with which most students are familiar.

Additionally, all medical students are covered under a blood and bodily fluids exposure rider. This works as a supplemental policy to any health insurance to cover treatment or medications necessary as the result of a needle stick, splash, or potentially contagious diseases exposure. The basic Rush University Health Insurance policy does not cover prophylactic medications or injections.

Finally, a fee has been assessed of medical students for vaccinations/immunizations and documentation. This fee covers any necessary blood tests, vaccinations, or updates, as well as costs associated with maintaining the documentation of their compliance and communicating that information to the Rush system hospitals, and any away elective locations who may request certification of immunization and vaccination status.


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Financial Aid Determination

The financial aid programs at Rush University are provided to assist students who cannot otherwise afford to pay the full cost of education through their personal or family resources. In general, financial need is the basic criterion for the awarding of funds by Rush University. Accordingly, students and their families will be expected to contribute toward educational expenses to the fullest extent possible. The level of the expected contributions is determined by using a standard set of criteria to analyze financial information provided by the students and their families. Submission of parent data for institutional grant assistance is required for all university students except those in graduate nursing or The Graduate College. Complete information about this policy is found at the Financial Aid web site www.rushu.rush.edu/finaid. The Office of Student Financial Aid staff is available to consult with students and parents on all matters regarding the financing of a Rush University education. Students and parents are welcomed and encouraged to make use of these services.

Financial Aid Awards

After evaluating the personal and family resources available to the student and taking into consideration awards from external sources, the Office of Student Financial Aid will award funds under the control of the University to students with demonstrated financial need. In varying quantities, a financial aid award may include grants, loans, and employment. In order to distribute the available funds in the most equitable manner, the Office of Student Financial Aid establishes a formula that designates the sequence in which funds are awarded to students and the maximum amount awarded under each program. The formula provides for a certain amount of loans and sometimes employment, before students are given consideration for grants. These formulas are applied consistently during any given year among all students at a given class level in a given college, as long as funds are available. Due to differences in the availability of funds from year to year and changes in eligibility requirements, the formulas are adjusted annually.

Financial Aid Process

Information on how to access financial aid information via the web is sent to all newly accepted students prior to enrollment. The web site states Rush's financial aid policy and procedures. The priority deadline for submission of materials is May 1st. Students must be enrolled at least half-time to receive financial aid. (Half-time is six hours or more per quarter for all programs except graduate nursing students who must be enrolled five hours or more per quarter.) To receive assistance, all appropriate forms and materials must be on file. Graduate and professional students should expect to receive the majority of assistance in the form of loans. Because of the limited institutional resources, financial aid awards may contain loans that accrue interest while the student is in school. Grant assistance is available; however, the funds are limited and all applicants (except graduate nursing and The Graduate College) must provide parent data and meet the institutional criteria for eligibility. Refer to the Financial Aid web site for details.

Undergraduate students who have not received a prior undergraduate degree are more likely to receive grant assistance through federal and state programs based on need. Undergraduate students obtaining a second degree must also provide parent data for grants and loans from Rush. Employment is possible in a number of university offices, as well as in other departments of Rush University Medical Center. Depending on a student's academic program, employment may be awarded as part of the financial aid package. It is the student's responsibility to secure employment, and the Office of Student Financial Aid assists students in locating jobs within Rush.

Satisfactory Academic Progress

Financial aid recipients at Rush University must maintain minimum standards of satisfactory academic progress for receipt of federal state, and most Rush University aid programs. Regulations require a maximum time frame for degree completion, a quantitative measurement (credit hours earned toward a degree), and a qualitative measurement (cumulative grade point average or acceptable pass/fail status). These criteria are checked at the start of each quarter, as well as at the end of each quarter, to determine whether students are maintaining satisfactory academic progress. Students denied financial assistance due to failure to make satisfactory academic progress may appeal to the director of their program. The director may request reinstatement of the student's satisfactory academic standing by providing to the Office of Student Financial Aid a written summary of the student's projected program and benchmarks by which progress will be measured. If approved, aid will be reinstated based on individual program eligibility.

Undergraduate Students

Time Frame Measurement. Students may take up to 150 percent of the time it normally takes to complete the programs. Students attending full-time in the undergraduate nursing and medical technology programs may have a maximum time frame of three years (nine quarters) to complete. Students in the perfusion therapy program may have a maximum time frame of ten quarters to complete the program. The actual credit hour limits are established by each program. All attempted hours will apply towards the degree requirements and time frame limits.

Quantitative Measurement. Both the College of Nursing and the College of Health Sciences programs have specific course requirements that must be taken in a specific sequence. The program of study is listed in the appropriate section of this bulletin. Each college monitors the progress of their students in determining the meeting of satisfactory academic progress. Students who fail to meet the program requirements may be given a modified schedule or may be dismissed. Each college monitors the progress of its students and only those students making progress are allowed to receive aid.

Qualitative Measurement. Both the College of Nursing and the College of Health Science programs have specific minimum grade point averages that must be maintained to maintain satisfactory academic progress. The minimum grade point average is 2.0 for these programs. Each college monitors the progress of their students in determining the meeting of satisfactory academic progress. Students who fall below a 2.0 grade point average are placed on academic probation and have two quarters to bring the grade point average back to 2.0. See the Academic Information - Academic Records and Policies section of this bulletin for specific information on the treatment of repeated coursework and incompletes.

Appeals and Reinstatement. Students whose academic progress is not in compliance with these standards and those of their program are identified by their respective program. They are also advised of the necessary steps for them to meet the program requirements, and of the appeal process. Students that have their aid terminated for failure to meet satisfactory academic progress may appeal for financial aid eligibility based on extenuating circumstances (i.e. illness, death in the family, or other unusual circumstances beyond the student's control). Appeals are made to the Director, Office of Student Financial Aid.

Graduate Students

Academic progress for graduate and professional students is monitored by the respective program. Consult the appropriate program section of the Rush bulletin and review the Academic Policies for that program. Graduate and professional students will be given a maximum time frame of twice the program length for completion of their program. Quantitative and qualitative measurements for satisfactory academic progress are defined for each program for which continued receipt of financial aid is necessary. Students that have their aid terminated for failure to meet satisfactory academic progress may appeal for financial aid eligibility based on extenuating circumstances (i.e. illness, death in the family, or other unusual circumstances beyond the student's control). Appeals are made to the Director, Office of Student Financial Aid.

Institutional Grants and Loan Funds

Organizations and named endowments provide a multitude of scholarship assistance to Rush University students. For detailed information regarding these scholarships and programs please visit the Office of Student Financial Aid.

Grants

Orpheus William Barlow, M.D.
Broda O. Barnes, M.D.
Leonidas H. Berry, M.D., Fund for Excellence
Myrna G. and Benjamin Brindley
Clare Bishop
Rhoda Grupe Brown Endowment
Alexander Brunschwig, M.D.
William J. and Irene L. Butler
Lela H. Cady
Carlson-Luckhart
Luther Christman
James G. Clark, M.D. and Ruth E. Schmidt, R.N.
Cole Foundation
Fred H. and Marie V. Burnek Decker
Louis C. Duncan
Economou and Associates
Catharine and R. Winfield Ellis-Philip N.Jones
Marie Erickson
Ethel Fanson
Clark W. Finnerud, M.D.
A. Clyde and Mae Freeland
Louis and Becky Friedman
Fry Foundation
Glore Nursing Endowment
Golden Apple Society
G. Howard Gottschalk, M.D.
Eunice Goebel Greeley
Jules and Eleanor Green
Alice L. Grimson
Harvey H. Grodzin, M.D.
Florence D. Hagenah
Health Systems Management Alumni
Carl Helgeson, M.D.
Marion E. Horween
Drs. Jones/Thompson/Ramsey/Kehoe
Philip N. Jones, M.D.
Economou and Associates Endowment
George M. Katzman, M.D.
Donna Kromer Hart
Gyl and David Kasewurm
John L. and Helen Kellogg
M. M. Kelly and C. D. Kelly
Esther and Hans Lawrence, M.D.
Earl Leimbacher, M.D.
George P. and Eva Lorraine
Mary and Foster G. McGaw
Carrie Belle McNeill Educational Fund
Sadie and Samuel Miller
Lou Mitchell
Raymond Morris, M.D.
Roberta R. Nordahl
Erma Page and Burton Lewis
Olive Pendill
Thora L. Plummer
Helen F. O'Brien
Pedro Pomo, M.D.
R. Joseph and Wendy E. Olk
Rush Medical College
Rush Medical College Class of 1975
Rush University Medical Center
  Medical Staff
  Nurses Alumni Association
  Women's Board
Rush University
Robert Ryan, Jr., M.D.
Ruth E. Schmidt
Gertrude and Eli Schnitz
Dr. Sylvio A. and Esther A. Sciarretta
Elizabeth Douglas Shorey
Joseph S. Silverstein, M.D.
Smith Barney Nursing Scholarship
Emily Birnie Smith
Charles H. Solomon, M.D.
Dorothy Lewis Stancliff
C. M. Swale
L. Jean Tews
Helen S. Thomas
Homer Thomas Trust
Eric Thompson
A. Thomson, M.D. - M. Friedman
Helen Vestergaard Endowment
Washington Square Foundation
Louis Wasserman, M.D.
JoAnn and Seymour Weisberg, M.D.
Daniel Welch, M.D.
Vivian Winslow Endowment
Dorothy E. Yates
Drs. Joan and Russ Zajtcuk

Loans

Rush University has loan funds available through resources provided by various donors and named loan programs.

Abbott Laboratories
Carl O. Almquist, M.D.
Mr. and Mrs. Harvey B. Anderson
Aileen S. Andrew Foundation
Baer Loan Fund
Broda O. and Charlotte W. Barnes
Irving E. Benveniste
G. Clare Bishop, M.D.
M. Irene Cavanaugh
Centel Corporation
Charity Hospital Association
Henry H. Everett, M.D.
Donald W. Fergusson
Fishkin Memorial
George Guibor, M.D.
Henry and Antonia Hasterlik
Estelle C. Herman
Illinois State Medical Society
John Jacques, M.D., and Lawrence Jacques, M.D.
Ruth E. Johnsen Memorial
Broor A. Johnson,, M.D.
Margaret V. Krehbiel
John H. and Margaret F. Krehbiel Loan
  in memory of George Flanagan, M.D.
Grace M. Marshall Educational Foundation
Dr. David Monash
Joseph J. Muenster, M.D.
Anne M. and Paul J. Patchen, M.D.
Frederick Henry Prince
RUMC - Medical Staff
RUMC - Woman's Board
Rush University
Henry Russe/Alumni Assistance
Heyworth and Catherine Sanford
Rev. Canon Savage Memorial
Maurice Z. Silton, M.D.
Simon M. Shubitz, M.D.
Searle Scholars Program
Procto C. Waldo
Jane Wheeler Warren
Vivian Weil
Alexander Wolf, M.D.


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"At Rush, learning is an active process in which each student is given opportunities to achieve the highest potential. The interaction between student and faculty member mirrors the interaction between patient and physician: an open dialogue and mutual concern for problems. A Rush medical education is the first step in a lifetime pursuit of knowledge and achievement of the highest quality patient care."

Thomas A. Deutsch, M.D.
The Henry P. Russe, M.D., Dean of Rush Medical College

Philosophy

The process of becoming a physician is unique for each student who enters Rush. Each brings to his/her medical school experience a distinct educational, psychological and social background. As students define career goals, each develops personal ways of coping with the demands imposed by the physician's role. The Rush Medical College curriculum encourages pursuit of individual interests by emphasizing a solid foundation in the basic sciences and by offering a wide range of elective opportunities in the Medical Center and in a network of affiliated and associated hospitals. Throughout the program, students are encouraged to develop habits of self-education and enthusiasm for the life-long study of medicine according to specific interests and objectives. Upon matriculation, students are assigned academic advisors whose primary responsibilities are to provide guidance and to serve as resources for students as they define professional goals, select courses, and deal with a variety of issues during their progress through medical school. Long after students have taken their last medical school examinations, the sense of responsibility for the welfare of their patients remains the most important stimulus to maintaining the highest level of professional performance. The Rush faculty seeks to provide educational opportunities and to create an environment that will foster the ability to meet these responsibilities with competence and compassion.

Objectives for the Medical School Experience

Prior to graduation from Rush Medical College, all students will have satisfactorily demonstrated acquisition of the following knowledge, behaviors, skills, and attitudes/values:

Knowledge

Familiarity with the functional principles and methods of the scientific disciplines basic to medicine
Understanding of the normal function of the organ systems and the human organism as an integrated whole
Understanding of the etiology, pathophysiology, epidemiology, and clinical significance of disease processes
Knowledge of the range of normal physical, cognitive, affective, and social growth and development of the human, and of common developmental disorders
Familiarity with the concepts and methods of epidemiology and statistics as they relate to disease distribution in populations and to management of individual patients
Awareness of the legal and ethical issues and controversies associated with the practice of medicine
Effective application of knowledge of basic science and pathophysiology of disease to evaluation, diagnosis, and management of patients in various clinical settings

Behaviors

Display of appropriate professional conduct and demeanor required for effective interaction with patients, families, and all members of the health care team
Demonstration of appropriate participation, initiative, and cooperation as a member of the health care team
Ability to interact collegially and effectively with physicians of other disciplines for the benefit of the patient whose care is shared
Development of rapport with patients and their families by interacting in a clear, precise, sensitive, humane, and informative manner

Skills

Development of essential skills in problem solving (information gathering and analysis, synthesis of hypotheses, construction of management plans) applicable to clinical medicine to include the following:

Ability to perform an accurate and complete history and physical examination of patients of all ages
Ability to record the history and physical examination data in an organized, accurate, and legible manner
Ability to present clinical information verbally in an organized, accurate, and succinct manner
Ability to select diagnostic studies in an efficient and cost-effective manner
Ability to identify a clinical problem, assess the problem, and develop sound diagnostic hypotheses
Ability to develop initial management plans to include therapy of disease, preventive/screening interventions, education of patients and families, and follow-up/continuing care
Ability to perform basic common clinical procedures, with understanding of indications, yield, risks, and techniques
Ability to recognize and institute initial management of patients with serious and life threatening conditions
Ability to critically read medical and clinical research literature to understand study design, results, limitations, and implications for causation, prevention, diagnosis, and treatment

Attitudes/Values

A commitment to ongoing learning, recognizing one's limitations of knowledge and skills and effectively addressing these learning needs
A commitment to treating all patients with dignity, respect, and confidentiality
A commitment to being culturally aware and sensitive, open-minded, and nonjudgmental
A commitment to caring for patients regardless of ability to pay and to facilitate access to care for underserved individuals and families
A commitment to ease suffering and provide comfort and support to dying patients and their families
A commitment to serving as the advocate of each patient

A thorough review has been conducted of the objectives for the medical school experience. Final approval of revised objectices will occur during the 2004-2005 academic year.

Admission Requirements

Selection Process. Rush Medical College is strongly committed to the selection of individuals who will become vital members of the medical community as students, practitioners, educators, and researchers. Throughout the curriculum, emphasis is placed on the preparation of physicians who will function chiefly as medical practitioners and who will be committed to the delivery of quality health care to a variety of populations, including those that are now underserved.

Because Rush seeks to train physicians who will be committed to meeting society's health care needs, the Committee on Admissions seeks excellence in academic achievement and in non-cognitive factors such as character, goals, personality, accomplishments, and experience. High scholastic achievement is only a partial qualification for acceptance. The Committee looks for individuals who exhibit social and intellectual maturity, personal integrity, motivation and concern. Strong preference for admission is given to residents of Illinois. Only those applicants who are citizens or permanent residents of the United States are considered eligible to apply.

Admission to Rush Medical College depends upon satisfactory completion of a minimum of 90 semester hours (135 quarter hours) of undergraduate study before matriculation. Applicants must also sit for the revised Medical College Admission Test (MCAT). Scores prior to 2000 will not be considered. Rush requires all entering students to have successfully completed at least eight semester hours of physics; eight semester hours of biology, with emphasis in zoology; eight semester hours of inorganic chemistry; and eight semester hours of organic chemistry. In lieu of eight semester hours of organic chemistry, students may take four semester hours of organic chemistry and four semester hours of biochemistry. Survey courses in the premedical sciences will not fulfill these requirements. Courses in mathematics, social sciences, and English are strongly recommended. The committee suggests that comprehensive courses be selected that includes study in the following areas:

- Biology - molecular, cellular, developmental, and population;
- Inorganic chemistry - properties of the elements, states of matter, chemical reaction, and aqueous solutions;
- Organic chemistry - stereochemistry, covalent bonding, hydrocarbons, and organic compounds;
- Physics - mechanics, electricity, wave characteristics, nuclear structure, thermodynamics, and optics.

Because the required courses provide the foundation upon which modern biological and medical sciences are built, the committee gives special attention to competence in these areas. The committee requires that all of the coursework submitted in fulfillment of specific admissions requirements must be evaluated on the basis of a traditional grading system. Such a system must employ a range of numbers or letters to indicate the comparative level of performance. If the applicant has received a grade of pass/credit for any courses on the required list, the instructor must supply, in writing, a statement evaluating the student's performance in that course. Applicants are advised to pursue subjects beyond the stated minimums if they have not done excellent work in the required courses.

Technical Guidelines for Admission and Promotion

Observation. Students should be able to observe demonstrations and experiments in the basic sciences, including but not limited to physiologic and pharmacologic demonstrations in animals, microbiologic cultures, and microscopic studies of micro-organisms and tissues in normal and pathologic states. Students should be able to observe a patient accurately at a distance and close at hand. Observation necessitates the functional use of vision auditory, and somatic sensation. It is enhanced by the functional use of the sense of smell.

Communication. Students should be able to speak, to hear, and to observe patients in order to elicit information, describe changes in mood, activity, and posture, and perceive nonverbal communications. Students should be able to communicate effectively and sensitively with patients. Communication includes not only speech but also reading and writing. Students should be able to communicate effectively and efficiently in oral and written form with all members of the health care team.

Motor. Students should have sufficient motor function to elicit information from patients by palpation, auscultation, percussion, and other diagnostic maneuvers. Students should be able to perform basic laboratory tests, carry out diagnostic and therapeutic procedures, and read graphic images. Examples of skills which may be required include the ability to perform phlebotomy, to start intravenous lines, to visualize microscopic preparations, to insert NG and Foley catheters, to obtain body fluids through a variety of diagnostic maneuvers, and to read x-rays and EKGs. Students should be able to execute motor movements reasonably required to provide general care to patients, and to either provide, or direct the provision of emergency treatment of patients. Examples of emergency treatment reasonably required of physicians are cardiopulmonary resuscitation, the administration of intravenous fluids or medication, the application of pressure to stop bleeding, and the opening of obstructed airways. Such actions require coordination of both gross and fine muscular movements, and functional use of the senses of touch and vision.

Intellectual, Conceptual, Integrative, and Quantitative Abilities. These abilities include measurement, calculation, reasoning, analysis, and synthesis. Problem solving, the critical skill demanded of physicians, requires all of these intellectual abilities. In addition, students should be able to comprehend three-dimensional relationships and to understand the spatial relationships of structures.

Behavioral and Social Attributes. Students should possess the emotional health required for full utilization of their intellectual abilities, the exercise of good judgment, the prompt completion of all responsibilities attendant to the diagnosis and care of patients, and the development of mature, sensitive, and effective relationships with patients. Students should be able to tolerate physically taxing workloads and to function effectively under stress. They should be able to adapt to changing environments, to display flexibility, and learn to function in the face of uncertainties inherent in the clinical problems of many patients. Compassion, integrity,

concern for others, interpersonal skills, interest, and motivation are all personal qualities that are assessed during the admissions and education processes. Requests for accommodation by individuals with a disability as defined by the Rehabilitation Act of 1973 or the Americans with Disability Act will be considered on the basis of their abilities and the extent to which reasonable accommodation, if required, can be provided.

Concurrent M.D./Ph.D. Program

Rush University provides opportunities for medical students who wish to enroll concurrently in a Graduate College basic science division to pursue a Ph.D. or M.S. degree. Such programs provide the foundation for careers in academic medicine and research. Students interested in these opportunities are encouraged to contact Graduate Program Directors prior to their second year and explore the options for a course of study tailored to their interests and backgrounds. Ph.D. programs are offered in The Graduate College divisions of Rush University as follows: anatomical sciences, biochemistry, immunology, medical physics, neuroscience, pharmacology, and physiology/molecular biophysics. Students engaged in concurrent degree programs must meet the full requirements of The Graduate College Division in which they are enrolled as well as those of Rush Medical College. If properly coordinated there is some economy of time when medical school courses meet division requirements. A typical M.D./Ph.D. plan would extend across seven years, i.e., a student completes the two-year pre-clinical curriculum in the medical college, a three-year program of graduate coursework and dissertation research in The Graduate College, followed by the two-year clinical phase of the medical curriculum.

The Rush Physician-Scientist Program

This program, leading to the M.D. and Ph.D. degrees, has been established for outstanding applicants to Rush Medical College who seek careers in academic medicine or as physician-scientists. Two openings are available each year in this program for students who seek doctoral training as laboratory scientists in disease and health related research. Inquiries about this special program should be directed to the Associate Dean of Medical Student Programs or to the Dean of The Graduate College. Applicants must be admitted to both Rush Medical College and The Graduate College. Students, in most circumstances, will receive tuition scholarships and stipend support for the Ph.D. phase of their studies. Having satisfied the requirements for progress in the graduate study phase, the student will also receive a tuition scholarship for the fourth year of medical school. Students in the Rush Physician-Scientist program are accepted ordinarily at large to The Graduate College, which means they are able to defer selection of a specific graduate division to their second year of medical school, pending exposure to lines of investigation through laboratory rotations.

Organization

The four-year Rush curriculum provides an appropriate background for individuals with a diversity of professional career goals. The curriculum is based on establishing a solid foundation in the basic sciences and clinical medicine through a core of required pre-clinical and clinical courses.

Curriculum - First and Second Years. The primary objective of the first year is to provide students with exposure to the vocabulary and the fundamental concepts upon which the clinical sciences are based. The first year is comprised of three quarters of basic science material organized by discipline, that emphasize the structure, function, and behavior of the normal person. The curriculum utilizes a variety of educational formats that include lecture, laboratory, small group discussions and workshops. In addition to the preceptor experience, introduction to interviewing, history taking, and physical examination are offered in a unique series of three courses that continue into the second year. Descriptions for the other courses listed below may be found in the section on courses.

The following courses comprise the **First Year Curriculum:**

ANA 451	Histology
ANA 471-472	Human Anatomy I, II
BCH 470-472	Biochemistry, Intro, I, II
BHV 451	Fundamentals of Behavior
BHV 453	Behavior in the Life Cycle
BHV 481-482	Ethics in Medicine I, II
IMM 505	Basic Immunology
NEU 451	Medical Neurobiology
PCM 500	Introduction to the Patient
PCM 511	Interviewing and Communication
PCM 515-516	Shared Medical Decision Making I, II
PCM 521-523	Preceptorship I, II, III
PCM 531-532	Health of the Public I, II
PHY 451-452	Physiology I, II

Second Year Curriculum. During the second year, students are concerned with the study of the causes and effects of disease and therapeutics. The three introductory clinical studies courses continue to complement the courses listed.

IMM 506	Clinical Immunology
MED 501-503	Clinical Pathophysiology I, II, III
MIC 451-452	Microbiology Concepts I, II
PCM 505	Physical Diagnosis V
PCM 507-508	Introduction to Clinical Skills I, II
PCM 514	Interviewing and Communication IV
PCM 518-519	Shared Medical Decision Making IV, V
PCM 524-526	Preceptorship IV, V, VI
PHR 501-502	Medical Pharmacology I, II
PTH 511-513	Pathology I, II, III
PSY 501	Introduction to Psychopathology
PVM 505	Epidemiology/Biostatistics

Curriculum - Third and Fourth Years. The curricula of the third and fourth years provide students with training in clinical skills, diagnosis, and patient management in a variety of patients care settings. Students must take and pass Step I of the examinations offered by the United States Medical Licensing Examination/ National Board of Medical Examiners (USMLE/NBME) before beginning core clerkships.

The clinical curriculum includes required core clerkships in family medicine, internal medicine, neurology, pediatrics, psychiatry, obstetrics/gynecology, surgery, and a required senior sub-internship in medicine, family practice, pediatrics, or surgery totaling 60 weeks. In addition, 18 weeks of elective study in areas of special interest to each student is also required.

With few exceptions, the required core clerkships are taken at Rush University Medical Center, John H. Stroger, Jr. Hospital of Cook County, or another Rush network institution. A minimum of eight of the 18 weeks of required elective work must be carried out at Rush University Medical Center or in a Rush-sponsored elective at a network institution. Up to ten weeks of additional elective study may be carried out at other approved institutions. Additional elective study may be taken but it will not count toward the degree. Core clerkships in family medicine, internal medicine, pediatrics, neurology, obstetrics/gynecology, psychiatry, surgery, and surgical selectives are completed during the third and fourth years. Senior year core clerkships include a sub-internship in internal medicine, family medicine, pediatrics, or surgery. Though scheduling of required core clerkships is somewhat flexible, students are strongly encouraged to complete these clerkships early in order to make better use of elective options in the fourth year. Students participate in assignment of required core clerkships although the final decision concerning core and elective clerkship rotations rests with the Director of Clinical Curriculum. Third year students are provided with a clinical skills assessment experience with standardized patients (in collaboration with the University of Illinois at Chicago's Clinical Performance Center). This experience is designed to aid in self-evaluation of one's clinical skills (communication and interpersonal skills, attitudes, and procedural skills) and is coordinated by Andem Ekpenyong, M.D. and Toshiko Uchida, M.D.

Academic Progression

Evaluation of progress at the medical college is an important part of the learning process. Course examinations are aimed at allowing both the students and the faculty to assess progress toward defined learning goals. The final result of evaluation in coursework is recorded as honors, pass, or fail. Grades of high pass may also be recorded during the third and fourth years. At the end of each quarter or clinical period evaluations are submitted to the Office of Medical Student Programs.

The Committee on Student Evaluation and Promotion. (COSEP) is a standing committee of Rush Medical College. The committee determines when students have satisfactorily completed requirements for promotion and may require additional study by students who have not satisfactorily completed aspects of the medical college curriculum. It also recommends candidates for the degree of Doctor of Medicine to the Faculty Council and accepts the responsibility of recommending to the Faculty Council the dismissal of any student whose academic performance, including non-cognitive as well as cognitive aspects, is unacceptable in the judgment of the committee. USMLE/NBME sub-tests are occasionally used by departments to evaluate student knowledge. Scores from these examinations are kept confidential and are not available to any other institution or agency without the prior written permission of the student. Students may review their complete academic record in the Office of Medical Student Programs on Tuesday through Friday afternoons or by appointment. Rush uses a system of student anonymity for all written examinations in the pre-clinical curriculum. Performance in courses is known only to the student, his/her academic advisor, the course director for each course, and appropriate members of the Office of the Dean, provided that a minimum passing level of achievement has been demonstrated. Otherwise, the information is also presented to COSEP. Ratings by clinical instructors and, in most instances, oral and written examinations form the basis of evaluations of student performance in clerkships and, therefore, also the basis of recommendations for residencies. At the time of application for post-graduate training, a letter of evaluation is written by the Office of Medical Student Programs. Prior to the composition of this letter, an individual conference is held with the student, and all pertinent factors for the letter of evaluation are assessed.

Academic Policies*

Credit Hours. Rush University is on a quarter system. Each quarter is at least ten weeks in length. Rush Medical College assigns no credit hour value to its courses. Medical students are enrolled full time even when carrying a reduced course load. Additionally, the clinical portion of the curriculum deviates from the quarter system by specifying the number of weeks of full-time study spent in each and the course appears on the transcript in the quarter in which the course commenced.

Credit by Examination. A student who passes a proficiency examination at Rush University will earn academic credit toward the degree. Information that is posted on the transcript is the course prefix and number, title, and a grade of "K". A transcript guide that accompanies all transcripts issued by the Office of the Registrar explains that the K grade means credit was earned through proficiency examination.

Students in Academic Difficulty. Course directors will, at the earliest possible time, notify the Office of the Dean of the college of any students having academic difficulty. The Office of Medical Student Programs will work with such students, their academic advisors, and with course directors to clarify the nature of the problem and to seek appropriate solutions. Students in academic difficulty should establish contact with the course director, their academic advisors, and appropriate members of the Office of the Dean to explore the factors relating to the student's academic difficulty.

Academic Probation. A student with significant academic deficiencies as determined by COSEP shall be considered on academic probation. Students placed on academic probation are thereby informed that there is serious concern about their academic performance and that they are subject to dismissal from the college should their unsatisfactory academic performance continue. Students will be notified in writing why they have been placed on probation and what requirements must be met to be removed from probationary status. Students on probation may not register and receive credit toward the M.D. degree for courses (including clerkships) at other institutions without the consent of the Office of the Dean.

Automatic Probation. A student who has outstanding failures in courses scheduled for a total of 90 or more contact hours, who has a failure in a single required clerkship or who does not pass the United States Medical Licensing Examination (USMLE), Step I by November of the third year will automatically be placed on academic probation.

Probation by COSEP. COSEP may place on academic probation any medical student who demonstrates deficiencies that COSEP, in the reasonable exercise of its discretion, finds to be significant. Removal from Probation. A student will remain on probation

until he/she has made up all academic deficiencies and has met any other requirements established by COSEP for removal from probation.

Changes in Student Status. The following policies apply to students who are changing their status: Scheduling First-Year Studies Over Two Years. Prior to the start of the spring quarter of the first year, a student may petition COSEP for permission to complete the requirements of the first year over a two-year period. A proposed schedule of courses, developed in consultation with a member of the Office of Medical Student Programs, will be presented to COSEP as part of the student's petition. COSEP will decide upon such petition and advise the student in writing of its decision.

Leave of Absence. The Associate Dean for Medical Student Programs will decide upon each request for leave of absence and will determine the duration of the leave and the conditions, if any, for resuming status as a full- or part-time student. A student may not go on a leave of absence without first stating in writing to the Dean his/her intent to return to the college to complete the requirements for the M.D. degree. In addition to this letter, students are required to clear the University by processing a Leave of Absence form available from the Office of the Registrar. This clearance procedure ensures the student that he/she will be informed of any issues affecting student loans or financial aid, and that timely notification of his/her change of status is sent to the AMA and AAMC. The dean will consult with COSEP insofar as possible before approving a leave of absence for a student with academic deficiencies. (See Academic Information section for an additional requirement.)

Withdrawal from the University. Withdrawal is the voluntary termination of enrollment by a student. A student who withdraws and subsequently seeks reinstatement must submit a written petition for reinstatement to the Committee on Admissions of the college, if withdrawal took place before the completion of the student's first quarter of enrollment. If the student withdrew subsequent to the first quarter of enrollment, the student must submit a written petition for reinstatement to be reviewed by COSEP. Recommendations by COSEP are then sent to the Dean. All students withdrawing from the University are required to observe a clearance procedure by processing a withdrawal form available from the Office of the Registrar. This procedure ensures the student that they will be advised of consequences to their loan deferment status, financial aid, and provides timely notification to the AMA and AAMC of their change in status. A student who fails to register and enroll in courses according to the policies of the college will be considered to have withdrawn. A student withdrawing under this provision may submit a written petition for reinstatement to the Dean. The Dean determines if special circumstances existed that justified the student's failure to register or whether the student's petition should be forwarded to the appropriate faculty committee as set forth in the above paragraph.

Suspension. Suspension is the administrative termination of the enrollment of a student for a specific period of time.

Dismissal. Dismissal is permanent administrative termination of the enrollment of a student. The following will constitute grounds for academic dismissal from the college:

- Outstanding failures, in any combination, in the first or second years in courses whose total of scheduled instructional hours equals or is greater than 35 percent of the total scheduled instructional hours for the entire first or second year. (An outstanding failure is a failure which remains after a student has not passed a course's single make-up examination or which remains because the student did not qualify to take the make-up examination.)
- A second failure in any required core clerkship
- A failure in a second required core clerkship even though one may have previously been made up
- Unsatisfactory completion of a remedial program by a student on academic probation where satisfactory completion of such program was a requirement for continued enrollment
- A determination by COSEP that a student is not fit to practice medicine. Fitness for the practice of medicine includes demonstrated ability to be a competent and effective physician and performance which reflects good moral character, a sense of responsibility, sound judgment, and the ability to master and properly apply subject matter
- Failure after three attempts to pass the Step I of the United States Medical Licensure Examination shall constitute grounds for automatic dismissal

Procedure for Dismissal. When a student is subject to dismissal the following procedures will be followed:

COSEP Action. COSEP will review the performance of a student in accordance with these rules and, where appropriate, may recommend the dismissal of a student. The chairperson of COSEP will notify the student who is subject to a COSEP recommendation for dismissal of COSEP's action and of the student's opportunity to meet with COSEP before it submits its recommendation to the Faculty Council. If the student fails to request a meeting with COSEP within 14 days from receipt of the chairperson's notice, the student will have waived any right to such meeting. The chairperson of COSEP will determine the procedures for conducting the meeting with the student and will in his/her sole discretion determine whether any participant in the meeting may be represented by an attorney. After meeting with the student, if such meeting is requested in a proper and timely manner, COSEP will submit its recommendation in writing to the faculty council.

Faculty Council Action. Within a reasonable time following its receipt of COSEP's recommendation, the Faculty Council will consider the recommendation. The vice chairperson of the council will chair meetings of the council when the council is considering recommendations for the dismissal of a student and will invite the student and the student's faculty advisor to attend the Faculty Council meeting during its consideration of the COSEP recommendation affecting the student. The Faculty Council may in its sole discretion conduct a part of its deliberations concerning such recommendation outside the presence of the student and his/her advisor. The vice-chairperson of the Faculty Council will determine procedures for conducting its meeting with the student and will in his/her sole discretion determine whether any participant in the meeting may be represented by an attorney. The Faculty Council will submit its written recommendation together with COSEP's recommendation to the Dean.

Dean's Action. The Dean will consider the recommendations of COSEP and the Faculty Council and will make the final determination concerning the affected student's status in the college. The Dean will notify the student, COSEP, and the Faculty Council of his/her decision in the matter.

Examinations in a Course. The attainment of course goals by students should be evaluated by written examinations and/or other appropriate means. The course director will determine the number and format of examinations. Courses with more than 50 hours of scheduled instruction per quarter should include more than one examination or other evaluative exercise per quarter. Students should refer to the course director and course materials concerning those requirements (e.g., attendance).

Course Grades. All pre-clinical courses in the curriculum use a uniform minimum pass level: a score of 70 percent or 1.5 standard deviations below the class mean, whichever is lower. Additionally, there is the provision that any student with a score of less than 55 percent will be considered to have failed regardless of the mean pass level determined by the curve. A grade of "honors" may be given at the discretion of the course director to students whose performance falls within the top 15 percent of the class.

Examination Period. In the medical college, no pre-clinical classes are scheduled during the examination period; examinations in pre-clinical courses are scheduled by the Assistant Dean for Pre-clinical Curriculum.

Incomplete Grades. The grade of incomplete (I) is given only when circumstances beyond the student's control prevent completion of course requirements and the student has received permission to defer completion of these unmet course requirements. The course director will determine what work will be required to remove the incomplete and will establish a specific time within which the student must complete such work. Upon completion of the requirements, the "I" grade will be replaced by the new grade.

In-Course Make-up Examinations. Students may be guided by the following policies concerning in-course make-up examinations:

Excused Absences. Students with valid reasons may request permission from the Office of Medical Student Programs to reschedule an examination. The decision to grant such permission will be made by the Dean's office in consultation with the course director.

Unexcused Absences. A course director is not obligated to provide a make-up examination for an unexcused absence from an examination.

Make-up Examinations for Failed Courses in First and Second Years. A student receiving a failing grade at the completion of a course shall be given an opportunity to take a single make-up examination as a means of demonstrating his/her proficiency in the subject to rectify his/her failure. However, a student who fails a course with a score more than two standard deviations below the class mean will not be offered such a make-up examination. Further, a student may take make-up examinations in no more than two courses in any one quarter. If more than two courses are failed, the student, in consultation with his/her academic advisor, may choose which examinations to take. Make-up exams will be completed no later than the first week of the quarter following a course failure. Format, content, and passing grade for make-up exams will be determined by the course director. Make-up examinations will be scheduled by the Dean's office in consultation with the appropriate course directors.

Status of Students with Course Failures. COSEP shall review the status of students who fail make-up examinations or who have outstanding course failures for which they did not qualify to take make-up examinations and will consider options for remedial work. COSEP shall review the status of all students who fail a clinical clerkship. At appropriate times during the academic year, as determined by the chairperson of COSEP in consultation with the Associate Dean for Medical Student Programs, COSEP will review the progress of each student who has failed a course. After such review, COSEP will either establish requirements that a student must meet in order to resolve his/her deficiencies in academic performance or will recommend dismissal. No student will be promoted from the second year to the third year until he/she satisfactorily completes all requirements of the first and second years. COSEP, in its discretion, may schedule second-year courses concurrently with make-up work for unsatisfactory first-year work, as it may consider appropriate for an individual student.

* Additional policies are listed in the Academic Information section.

Remedial Programs for Students Failing Courses

First and Second Years. COSEP will establish requirements for remedial work for students with one or more outstanding course failures in the first or second year. Remedial work requirements will be reasonably related to the seriousness of the student's deficiencies. Such requirements may include, but need not be limited to the following: Summer tutorial study with re-examination; participation in an approved summer course; retaking failed courses during the next academic year; and retaking all courses including those satisfactorily passed. In developing requirements, COSEP will consider the needs of the individual student and will endeavor to develop a program that, if successfully completed, will strengthen the student's prospects for successfully completing the remainder of his/her college program. Students who have no outstanding failures at the end of an academic year, but who have had to take make-up examinations in courses whose total of scheduled instructional hours equals or exceeds 30 percent of the complete program of instruction for that entire academic year may be placed on academic probation, in which situation COSEP will establish the requirements which students must meet before they are able to proceed to the studies of the next academic year.

Third and Fourth Years. A failure in a required core clerkship must be made up in a manner prescribed by the course director in consultation with the Assistant Dean for Clinical Curriculum, approved by COSEP, and consistent with the reasons for the student's failure. Should a student be required to repeat all or part of the clinical rotation, effort will be made to have the student work with different supervisory and instructional staff. A student required to repeat clinical work in a required core clerkship must complete the failed course prior to beginning another core rotation. A student failing an elective clerkship must either repeat the elective or, with the approval of the Dean's office, complete an alternative elective.

Failure to Pass Step I of United States Medical Licensure Examination. All students must take Step I of the USMLE at the completion of their second year. Permission to defer taking this examination must be granted by the Office of Medical Student Programs. Students who do not pass USMLE Step I by November of their third year will be placed on probation and reviewed by

COSEP. COSEP may require the student to defer part or all of his/her clinical program to provide sufficient time for preparation. Students who fail the examination three times will be automatically dismissed.

Graduation Requirements. The following are prerequisites to the granting of the degree of doctor of medicine by Rush University: The level of achievement required by the faculty for the degree of doctor of medicine must be attained in a minimum of 35 months. Credit toward the M.D. degree may be granted to a student by the Office of the Dean for appropriate coursework accomplished prior to matriculation at Rush Medical College. A minimum of 78 weeks of instruction at Rush Medical College is required for students entering at the third-year level from other medical schools. The Committee on Student Evaluation and Promotion may recommend additional weeks of instruction depending upon the progress made by any Rush Medical College student. Each student's progress in each year of the Rush Medical College curriculum will be evaluated by the Committee on Student Evaluation and Promotion, and additional study may be required in any year for students with academic difficulty. Students must pass all courses in the pre-clinical years before entering the clinical phase of the curriculum. Prior to conferral of the degree, students are required to pass Step 1 and complete Step 2 of the USMLE. Students may not graduate if they have not taken Step 2. Students may participate in June commencement ceremonies if they have passed all required clerkships and Step 1 of the USMLE, are scheduled to take USMLE Step 2, and are scheduled for completion of all elective clerkship requirements by December 31st of the same year.

Policies Concerning Student Misconduct

The Committee on Student Judiciary Review is charged with investigating and adjudicating charges of student misconduct of a nonacademic nature, including but not limited to violation of commonly accepted ethical standards of an academic community, such as cheating and plagiarism; falsification of student records, transcripts, financial aid forms or applications; unlawful use or possession of controlled substances on the Medical Center campus; conviction of a crime deemed serious enough to render the student unfit to pursue his/her profession; or other conduct that is inconsistent with generally accepted standards of behavior within an academic community or the medical profession. All charges of student misconduct of a nonacademic nature will be presented to the Associate Dean for Medical Student Programs. If in the opinion of the Associate Dean, the matter may be resolved without a hearing, an attempt may be made to do so. The student charged with misconduct or the Associate Dean may at any time exercise the right to have the charges heard by the Committee on Student Judiciary Review. In every case, the Associate Dean will notify the complainant in writing by registered letter within 30 days of receiving the complaint as to whether the matter was resolved without a hearing or whether the matter was referred to the Committee on Student Judiciary Review. If a disposition requires more than 30 days, the Associate Dean will notify the complainant in writing every 30 days until the matter has reached a disposition.

If the complainant is dissatisfied with the resolution of a matter that has not been referred to the Committee on Student Judiciary Review for a hearing, he/she may request that the decision be reviewed by an ad hoc committee consisting of two faculty members and one student appointed by the Dean. In order for a complainant to initiate a review of the Associate Dean's decision, the complainant must notify the Associate Dean in writing that he/she seeks a review, and the notification must reach the Associate Dean within 15 working days from the time the complainant received written notification of the Associate Dean's disposition. Upon a timely request, the Dean will constitute the Ad Hoc Committee within two weeks. Members of the Ad Hoc Committee may not simultaneously serve as members of the Committee on Student Judiciary Review. The Ad Hoc Committee will convene to accept testimony (in person or in writing) from the complainant, the student charged, and the Associate Dean. The Ad Hoc Committee will only accept evidence that addresses the issue of whether the Associate Dean failed to consider certain relevant facts that would warrant a full hearing. In such a review, the Committee may reach one of two decisions by a simple majority vote: 1) endorsement of the Associate Dean's prior disposition or the matter or 2) a decision ordering that the Committee on Student Judiciary Review hear the matter in a full hearing.

The decision of the Ad Hoc Committee shall be in writing, shall contain a summary of the evidence and testimony upon which the decision is based, and shall be delivered to the student, the senior representative body of the college, and the Dean. The senior representative body shall consider the committee's determination and any written exceptions to said determination submitted by the student, and shall render its recommendation adopting, rejecting or modifying, in whole or in part, the committee's conclusion. Copies of the senior representative body's recommendation shall be transmitted to the Committee on Student Judiciary Review, the student and the Dean. The Dean will then consider the matter with respect to the charges of misconduct.

Student Conduct and Academic Honesty

Rush Medical College Honor Code.

- Rush Medical College students have instituted this honor code to affirm their commitments to academic and personal integrity, sound moral character, and respect for the rights and dignity of others. The spirit of this code is in keeping with our aspirations as future practicing physicians to uphold values of responsible behavior and honesty in dealing with patients, peers and colleagues.
- This commitment confers a shared responsibility of faculty, staff, and students in the Rush University community to ensure the highest standards of behavior, whether this is in the classroom or in the clinical setting. This responsibility includes efforts to mini mize factors that put individuals at risk for inappropriate action and to keep an open forum for discussion of ethical and profes sional issues.
- This Honor Code does not specifically address all forms of inap propriate behavior but it does apply to conduct throughout the undergraduate curriculum. In the pre-clinical curriculum, con cerns include security of examination materials, various forms of cheating on examinations, plagiarism, and respect for intellectual property protection in reference to syllabus materials, copyrights, and electronic media. In the clinical pre-professional setting, professional behavior is central to the student's educational experience.
- In recognition of the responsibility to uphold these standards, a student or faculty member who becomes aware of or suspects

inappropriate conduct is bound to consider several options: fore most would be to approach an individual directly with regard to the particular concern; or, after due consideration, to report the concern to the appropriate authority for purposes of investigation. Such allegations, which may or may not name (an) individual(s), can be made to supervisors, program directors or administrators, the Committee on Student Judiciary Review, or to the Associate Dean of Medical Student Programs.

- It is our belief that recognition of these factors, while mostly self-evident, has a significant impact on the fairness and standards of professionalism at Rush Medical College. It is commitment to these ideals, in addition to the development of competence as a student to meet the challenges of medical training, that are at the core of our future as practicing physicians.

- I understand that this signed document becomes part of my permanent record and I am expected to abide by and uphold the letter and the spirit of this Honor Code throughout my medical education."

Please see the "University Statement on Academic Honesty" in the General Information Section of this Bulletin for additional policies.

Academic Advisor Program

The Academic Advisor Program consists of specially selected faculty members for each class who provide counseling and guidance for cohorts of approximately fifteen students each throughout the four years of medical school. The advisors are informed of current policies, procedures and trends affecting students' participation in curricular and non-curricular aspects of medical school by the director of the academic advisor program, who is responsible for program planning, coordination, and evaluation. Advisors provide counseling in three interrelated areas: academic (regarding the acquisition of the knowledge and skills for becoming a competent physician), personal (regarding the growth and development of the person), and professional (regarding the selection of a career and graduate training program for which the individual is best suited).

Rush Medical College Committees

Committees exist within the structure of Rush Medical College to assure the appropriate involvement of faculty and students in the various activities of the college. Except for the Rush Medical College Student Council, each committee includes representation from both faculty and students.

Faculty Council. This committee is the senior representative body within Rush Medical College. The membership includes nine professors, three associate professors, three assistant professors, three instructors or assistants, and one student from each of the four classes, each chosen by vote of the corresponding constituency.

Committee on Committees. This committee has as its primary responsibility the nomination of individuals to serve on the various standing committees of the medical college. Sitting as the Committee on Dialogue (a subset of the Committee on Committees), the committee is also responsible for dealing with grievances presented by members of the Rush Medical College community.

Student Council. The council is the representative government for students of Rush Medical College and consists of five representatives from each of the four classes within the medical school. The council provides a means to facilitate the exchange of information on issues affecting the student body.

Standing Committees of Rush Medical College

Committee on Academic Freedom. This committee concerns itself with questions of academic freedom. It works closely with the Committee on Dialogue and the Faculty Council in resolving grievances involving questions of academic freedom.

Committee on Admissions. Members of this committee are responsible for recommending students to the Dean for admission to the medical college. The duties of the committee members include selecting those applicants who will be interviewed; interviewing candidates; choosing applicants who will be offered acceptances to the medical college; and reviewing criteria applied from medical student admissions to maintain academic excellence.

Committee on Affirmative Action. This committee serves to advise the dean and the faculty regarding policies, procedures, and issues that affect the recruitment, retention, and promotion of minority and women faculty and students in the college. The committee works closely with the equal opportunity coordinator for academic affairs.

Curriculum Committee. This committee is responsible for the design and content of the curriculum. On the basis of its own surveys and the evaluations of the Committee on Educational Appraisal, it evaluates the need for and, as deemed appropriate, develops recommendations for curricular modification.

Committee on Educational Appraisal. This committee is responsible for evaluating the courses of Rush Medical College. The committee administers, with the assistance of each course director, and analyzes course, clerkship, and faculty assessments provided by students. An annual report is produced for each course within the medical college curriculum.

Committee on Senior Faculty Appointments and Promotions. (COSFAP)The function of this committee is to review recommendations submitted by chairpersons for appointments or promotions of faculty members to academic ranks of indefinite terms in Rush Medical College. Recommendations for appointments or promotions are then submitted to the Office of the Dean for further action.

Committee on Student Affairs (COSA). This committee is concerned with non-curricular needs of medical students. Its regular responsibilities include an annual evaluation of the effectiveness and adequacy of programs and services available to students, improvement of current programs, and initiation of new activities when their need is recognized. The committee works closely with the Office of Student Affairs.

Committee on Student Evaluation and Promotion (COSEP). This committee is responsible for developing policies concerning student status, evaluation and promotion; reviewing the academic performance of medical college students; making recommenda-

tions to the Faculty Council and Dean concerning promotion, graduation and dismissal of students; and determining requirements for remedial action for students who have failed medical college courses.

Committee on Student Judiciary Review. It is the responsibility of the Committee on Student Judiciary Review to develop and recommend to the Faculty Council policies and procedures which promote the maintenance of ethical and professional standards for Rush Medical College students and to investigate and adjudicate charges of student misconduct of a nonacademic nature including, but not limited to: violations of commonly accepted ethical standards of an academic community, such as cheating and plagiarism; falsification of student records, transcripts, financial aid forms, or applications; unlawful use or possession of controlled substances on the Medical Center campus; conviction of a crime deemed serious enough to render the student unfit to pursue his/her profession or other conduct which is inconsistent with generally accepted standards of behavior within an academic community or the medical profession. All charges of student misconduct of a nonacademic nature shall be presented to the Associate Dean for Medical Student Programs by students or faculty. The committee shall submit its recommendation to the Faculty Council, which, in turn shall make a recommendation to the Dean who will then render a final, unappealable decision on the charges.

Student Research Opportunities

Students are encouraged to have some research experience while they are in medical school. The opportunities range from laboratory experiences in the biomedical sciences to clinical investigation and fieldwork in epidemiology, preventive medicine, and primary care. Such research can be carried out during summers or during time allotted for elective experiences. The student's academic advisor and the Office of Medical Student Programs will assist in arranging for research experiences.

Continuing Medical Education

The Office of Continuing Medical Education supports the sponsorship of medical and health professions symposia, workshops, and conferences for practicing professionals. Students may register at reduced rates for some Rush-sponsored programs. The staff provides services to faculty and staff of the University and Medical Center that include consultation in planning meetings, budget preparation and marketing, including strategy and brochure development, printing and advertising. A computerized registration system maintains attendee records, confirmation letters, and attendance lists. For each meeting, the office prepares nametags and completion certificates. All programs are supervised by an experienced meeting planner who directs the marketing activities, orders all supplies and audio visual equipment, and is on site during the program to assure its smooth operation. After the program concludes, the meeting planner prepares a program evaluation, a complete financial report, and detailed marketing and registration summaries.


RUSH UNIVERSITY
COLLEGE of NURSING
IHSM

"The mission of the College of Nursing of Rush University is to set a national standard for excellence in the education of nurses, lead the development and application of clinically-relevant science, and create service strategies for meeting the health needs of a diverse society. The mission is supported within a dynamic, multidisciplinary institutional culture in which education, research, and clinical practice are unified."

Kathleen Gainor Andreoli, D.S.N.
The John L. and Helen Kellogg Dean, College of Nursing
and Vice President, Nursing Affairs

Philosophy

Rush University College of Nursing is committed to providing excellence in professional education for nurses. The education of students is facilitated by the unification of the academic and clinical practice components of the health care system. This unique integration stimulates excellence in education, practice, scholarly activities, and professional leadership by the faculty and the graduates of the College of Nursing.

Nursing. Nursing is a profession and discipline that generates and uses knowledge to maximize the health of humankind. Through scientific inquiry, knowledge is generated and disseminated to improve practice, enhance education, and influence the organization and delivery of health care. Through the synthesis and application of knowledge, nurses contribute autonomously and collaboratively with other professionals to achieve positive health outcomes. Nursing standards define client outcomes for which nurses are responsible, and the nursing profession's accountability to the public. Nursing services are an essential element across the spectrum of health care, including health promotion and disease prevention, health restoration, and health maintenance. Within an ethical framework, nurses demonstrate compassion, advocacy, and cultural sensitivity for individuals and groups.

Health. Human health is a dynamic process, reflecting the interaction of biological, psychological, sociological, and belief systems within internal and external environments. Primary, secondary, and tertiary prevention of health related problems are essential for the optimal functioning of individuals across the life span.

Society. Nurses are prepared to meet and respond to the health and illness needs of society. The changing nature of societal needs requires knowledge and skills enabling effective individual and group interventions. Emphasis is given to special at-risk populations, with consideration given to diverse characteristics such as culture, race, ethnic groups, gender, age, income, and functional abilities. Whether societal needs are met by the delivery of direct services or indirect services through participation in the policy process, nursing actions are based on science and research. Central to the health of society is an understanding of world interdependence.

Education. Knowledge from the sciences, arts, and humanities is integral to education for professional nursing, giving students an understanding and appreciation for the value of the human experience. Nurse educators foster student growth by planning learning experiences in the primary, secondary, and tertiary settings where faculty practice. Scholarly inquiry, clinical judgment, life-long learning, and creative leadership are essential for the profession, thus, development of these qualities is fostered in students at all program levels. Learning is a shared responsibility between educator and learner. Syntactical learning prepares the nurse to develop individualized care for unique practice situations. Contextual learning promotes the systematic analysis of internal and external conditions influencing the discipline and practice of nursing. Inquiry learning fosters reflection, criticism, independence, and creativity. Through syntax, context, and inquiry students are prepared to meet current and future health care challenges.

Degree Offerings

Four degree offerings, Bachelor of Science in Nursing (B.S.N.), Master of Science in Nursing (M.S.N.), Doctor of Nursing (N.D.) and the Doctor of Nursing Science (D.N.Sc.) comprise the various exit points. Movement from one exit level to the next is always contingent upon evidence of academic success at previous levels of study. Academic progression is reviewed regularly and students are advised of the options available to them.

Entry Points. Several entry points are available, depending upon the educational goals and academic background of the student:

- B.S.N. 7-Quarter Option:
  College student with 90 quarter hours of college credit
- B.S.N. 4-Quarter Option:
  Graduate of a baccalaureate program
- R. N. - B.S.N. Option:
  R.N. with a minimum of 90 hours of college credit
- M.S.N. Options:
  R.N. with baccalaureate degree in a field other than nursing
  R.N. with baccalaureate degree with an upper-division major in nursing
- N.D. or D.N.Sc. Option:
  R.N. with a master's degree in nursing

Quarters of Entrance. B.S.N. seven-quarter option students begin in the fall quarter. B.S.N. four-quarter option students begin in winter quarter. R.N. - B.S.N. students may begin fall or spring quarters. Students in the Master of Science in Nursing (M.S.N.) may begin any quarter with the exception of Anesthesia Nursing students who begin in the summer. Doctor of Nursing students (N.D.) begin in winter quarter. Doctor of Nursing Science students (D.N.Sc.) begin in the summer quarter. (If statistics requirements are not completed, D.N.Sc. students may enroll in those courses prior to summer.)

Admission

Prelicensure Level (B.S.N.). Students may enter Rush at the junior level after completing a minimum of two years at another accredited college or university. An individual may attend either an approved post-secondary institution of his/her choice or one of 13 colleges and universities affiliated with Rush. Students interested in attending an affiliated school are encouraged to submit applications to the affiliated colleges and universities soon after the beginning of their senior year in high school. Each college has its own entrance requirements. The student's academic progress will be monitored by both Rush and the health careers advisor on the affiliated college campus. Students meeting the objectives of the pre-health curriculum, obtaining the approval of the health careers advisor, completing all required documents and passing review of the Admissions Committee, will continue at Rush University to pursue the final two years of the program. Transfer credit is not awarded for required coursework in which the student earned less than a C grade. Physical education and technical skill courses are not accepted for transfer credit. The College of Nursing also has expedited admission agreements with eight local community colleges. Students from these colleges who meet the admission criteria are given preferential admission into the program. (See the College of Nursing web site for a complete listing of affiliates and expedited admission colleges, www.rushu.rush.edu/nursing).

Program Prerequisites. A college student or R.N. with 90 quarter hours of college credit must take coursework that includes the following:

- Natural Sciences - 24 quarter hours minimum
  Required courses include inorganic and organic chemistry, human anatomy and physiology and microbiology.
- Social Sciences - 20 quarter hours minimum
  Required courses include psychology, sociology and growth and development.
- Humanities - 12 quarter hours minimum
  Proficiency in composition at level II
- English Composition - 2 courses
- Introductory Statistics - 1 course
- College Level Mathematics - 1 course

Applicants must submit transcripts of all college work attempted and recommendations from three individuals who know the applicant well. Two recommendations must come from former teachers and one from the applicant's most recent employer, when applicable. Recommendations from family members or close friends are not permissible. All materials of the application are taken into consideration when evaluating an applicant.

Graduate Nursing Levels of Study. Each applicant to graduate study should have earned a baccalaureate degree with a recognized upper-division major. The majority of credit toward the degree should be earned through university level coursework. Previous nursing coursework completed at other schools or at schools not offering an upper-division major in nursing must be validated. Programs of study developed by the student and his/her advisor incorporate core cognate and practica requirements for the exit option selected by the student. Progression from one level of graduate study to another requires maintenance of stipulated academic standards. Applicants to graduate study must submit transcripts of all college work attempted and Graduate Record Examination (GRE) results. Registered nurses must submit proof of licensure in at least one state or jurisdiction. M.S.N. applicants must complete an interview with at least one faculty member and submit recommendations from three persons able to evaluate his/her potential for success in graduate study. D.N.Sc. applicants must complete two interviews and submit at least one recommendation from a person who has a doctoral degree. Students taking courses under unclassified status will not be admitted if their Rush GPA is below 3.0. All materials submitted for evaluation are taken into consideration. The faculty may recommend an exit option different from the one requested based upon an evaluation of the applicant's potential for success in the curriculum.

Deadlines for Application. Current application deadlines for prelicensure and graduate nursing programs may be obtained at our web site at www.rushu.rush.edu or by contacting the Office of College Admissions Services. All application materials must be received by the indicated deadline. Applicants are encouraged to apply early in order to avoid missing deadlines due to a lack of required documentation. Specific graduate areas of concentration have pooled reviews for all completed applications due to limited enrollments. The Office of College Admissions can provide current information regarding pooled review dates and requirements for each area of specialization.

Practice Experience Requirement for Admission to Specialization. Specific areas of concentration have R.N. practice requirements for admission to M.S.N. and Post-Master's programs. College Admission Services has information on current practice requirements. Applicants with less than the required experience for a particular specialty area of practice may in certain circumstances apply to general areas that do not have practice requirements and later apply for admission to the specialty area after meeting the minimal practice experience.

International Students. Students from other countries are welcome to apply to both undergraduate and graduate levels of study. Limited financial aid is available. All applicants whose native language is not English or have not completed their high school education in the United States must submit the Test of English as a Foreign Language (TOEFL) scores and the Test Of Written English (TWE). The minimum required scores are as follows:

Computer based TOEFL: 213 Total Score, 5 Essay Rating

Paper and Pencil TOEFL/TWE: 550 Total Score, 5 TWE

Post-Master's Non-degree Option. A post-master's non-degree option is available for R.N.'s with a master's degree in nursing. This program has been designed to facilitate the attainment of specific skills without replicating an entire graduate program. Transcripts are evaluated on an individual basis to determine advanced placement. Applicants should contact the Office of College Admission Services for specific admission requirements for each area of concentration. Applicants to the non-degree options must submit

transcripts of all college coursework attempted and evidence of R.N. licensure in at least one state or jurisdiction. All applicants must also complete an interview with at least one faculty member.

Curriculum

Bachelor of Science. The prelicensure curriculum consists of approximately 90 quarter hours of pre-health coursework including those program prerequisites listed in the admissions section. The two-year, seven-quarter upper-division nursing curriculum requires a minimum of 90 quarter hours of upper-division study in nursing and related science courses for a total of 180 quarter hours for the bachelor of science degree.

The one-year, four-quarter upper-division nursing curriculum requires the student to have earned a baccalaureate degree from an accredited college or university. Current programs of study for undergraduate students can be viewed online at: www.rushu.rush.edu/nursing/homepage

The Graduate Curriculum. The graduate curriculum allows the student to exit with the Master of Science in Nursing or, if accepted for further study, proceed for the D.N.Sc. A set of core courses is required for every student at the graduate level with additional hours for each higher degree. Cognate courses representing coursework from the biological, behavioral and organizational sciences are determined by each degree. Advanced clinical specialty courses are required as determined by an area of concentration. A minimum of 12 hours of practicum in the area of concentration for the M.S.N. degree is required. Course requirements vary in each area of concentration. The college reserves the right to modify course requirements in consideration of overall curricular goals and design. At least 55 quarter hours of graduate credit or more, depending upon specialization, are required for the M.S.N. degree. The N.D. degree requires at least 39 hours of post master of science study and the D.N.Sc. degree requires at least 125 quarter hours of post-baccalaureate study exclusive of the dissertation. Current programs of study for graduate students can be viewed on-line at: www.rushu.rush.edu/nursing

Master of Science in Nursing. The M.S.N. provides opportunities for focus in a nurse practitioner option or a clinical nurse specialist option. Area offered for these options are:

- **Nurse Practitioner Options:**
  Adult Acute Care, Adult Primary Care, Anesthesia, Family/Community, Gerontological, Neonatal, Pediatric, Pediatric Acute/Chronic Care, Psychiatric

- **Clinical Nurse Specialist Options:**
  Critical Care, Gerontological, Medical-Surgical, Pediatric, Psychiatric, Public Health

A dual degree option is available for those desiring advanced preparation in clinical nursing science and the critical management skills of business administration. Graduates earn the M.S.N. degree from Rush and the Master of Business Administration degree from the J.L. Kellogg Graduate School of Management at Northwestern University.

The **Master of Science in Nursing** requires completion of a minimum of 55 quarter hours of credit exclusive of prerequisites. The student is expected to complete the M.S.N. in no more than five years.

Doctor of Nursing. The Doctor of Nursing curriculum focuses on leadership in nursing and the business of health care. The student is expected to complete the N.D. in no more than five years.

Doctor of Nursing Science. The research doctoral program leading to the Doctor of Nursing Science (D.N.Sc.) is designed to develop nursing knowledge through the integration of research in advanced clinical practice. Cognate studies, research methodologies and exploration of clinical phenomena are integrated to address diverse and changing health care needs. The doctoral student and his/her advisor mutually define an individual program that includes an area of clinical nursing for specialization and investigation. The doctoral program will enable the graduate to have the investigative skills of a nurse-researcher and the leadership skills necessary to serve as a senior academician and influence health care systems. Completion of the D.N.Sc. is expected in no more than eight years.

Terminal Objectives for Graduates by Degree

Bachelor of Science in Nursing. The undergraduate B.S.N. program in nursing is designed to create a climate of learning for students to grow and develop as competent beginning professional nurses.

- Synthesize and apply knowledge from the humanities, biology, social, and nursing sciences to clinical practice
- Practice as a generalist in a variety of settings at all levels of prevention
- Demonstrate effective clinical decision making with a variety of client populations across the life span
- Collaborate with other members of the health team to define outcomes and provide cost effective care
- Participate in the evaluation and standards of practice
- Apply basic ethical principles in the delivery of care
- Apply concepts and principles of teaching and learning in working with client populations and members of the health team
- Critique and apply research findings in clinical practice
- Demonstrate an understanding of the process by which health care policy is influenced and made
- Participate in activities that promote professional and personal development

Master of Science in Nursing. The M.S.N. curriculum is designed to prepare graduates to function as advanced practice nurses for diverse populations with complex needs at all levels of prevention. These roles require a central focus on clinical practice with skills in education, research and leadership.

- Apply a variety of theories from nursing and related fields to nursing practice, education, and management
- Function as an advanced practice nurse in a specialty area of practice
- Provide culturally competent care within multidisciplinary health care systems
- Analyze and monitor the quality and cost effectiveness of clinical decisions

- Assume the roles of advocate, educator, and change agent for consumers within the health care systems
- Utilize research to provide quality health care, to initiate change and improve nursing practice
- Participate in the development and implementation of professional standards and policies for clinical practice
- Participate in the formulation of health and social policies
- Apply ethical and legal principles to complex health care circumstances

Doctor of Nursing. The N.D. graduate is an advanced practice nurse who is a leader with expertise in outcomes management and health policy and is prepared to function in complex environments.

- Assess, analyze, and evaluate complex environments
- Synthesize information from various domains to form evidence-based decisions
- Demonstrate skills to affect change through leadership and redesign of systems
- Analyze health care trends
- Use leadership skills to influence health and social policy for diverse client populations across levels of prevention

Doctor of Nursing Science. Graduates of the D.N.Sc. program will have the investigative skills of a nurse researcher and the leadership skills necessary to serve as senior academicians and influence health care systems.

- Synthesize and apply theoretical and research-based knowledge in the investigation of clinical phenomena
- Test and integrate multidisciplinary knowledge in models of clinical nursing practice across the levels of prevention
- Generate and disseminate research-based, clinically-related knowledge that has impact on developing nursing science, advancing nursing practice, and influencing health policy
- Analyze health care trends and utilize leadership skills to influence health and social policy for diverse client populations
- Participate in collaborative multidisciplinary practice and research
- Assume faculty responsibilities within a senior academic environment
- Function as a clinical nursing scientist

Academic Policies*

Continuous Enrollment. Following matriculation in the College of Nursing, a student must remain enrolled each quarter until all requirements for the degree are met and the degree conferred. Students enrolling only to complete requirements for a course in which a grade of incomplete ("I") was given must register for NUR 999 for zero credits. This course carries an enrollment fee (see Financial Affairs section). A student who fails to enroll for one quarter without explanation and has not been granted a Leave of Absence will be administratively withdrawn. Return to the program will require a new application for admission.

Registration for "Continuing Students". Following matriculation in the College of Nursing, continuing students must register during the designated period for "continuing students" as posted by the Office of the Registrar in the printed or online Timetable. Nursing students who register after this time in any quarter will be charged a $50 late registration fee (see Financial Affairs section). Students are also required to maintain health and safety requirements on an annual basis. Failure to do so will affect the student's ability to register for classes and will result in an additional monetary fine.

Academic Progression. Student progress in the College of Nursing is reviewed and evaluated in several ways. The academic policies established by the faculty are interpreted and applied by the student's academic advisor, the Assistant Dean and the Progressions Committee. The faculty reserves the right to request the withdrawal of any student whose conduct, physical or mental health, or performance demonstrates lack of fitness for continuance in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University. Since much of the work in nursing assumes that students will achieve a progressively higher level of understanding and skill, high academic performance is expected. The individual student is responsible for acquiring knowledge inside and outside of formal classroom and clinical settings.

Baccalaureate Students. Baccalaureate students will be considered in good standing at Rush University unless placed on academic probation. A cumulative grade point average (GPA) of 2.0 (A=4.0) must be maintained. Students must receive a grade of C or higher in all designated nursing courses and practica in order to progress. A student whose cumulative GPA falls below 2.0 may enroll for no more than two quarters as a probationary student to attempt to raise his/her cumulative GPA. (During each interim quarter the student must demonstrate improved academic performance.) If at the end of two quarters the required GPA is not attained, the student will be dismissed. Academic probation is limited to a maximum of two quarters during the entire academic program. An F, N or WF grade in any course is grounds for dismissal from the program. Permission may be given to retake a course at the discretion of the Progressions Committee. If permission is granted, a failed course must be repeated according to the schedule determined by the Progressions Committee. Students are limited to repeating only one clinical course. Additionally, students whose programs of study have been interrupted for academic or personal reasons will be required to successfully complete a refresher program prior to resuming the regular academic program. (Please see the Student Advising Handbook for complete information regarding these policies.)

Graduate Students. Students in all graduate programs must maintain a cumulative 3.0 average in graduate coursework to remain in good academic standing. A full-time student whose cumulative GPA falls below 3.0 may enroll for one quarter as a probationary student to attempt to raise his/her cumulative GPA. A part-time student may enroll for two quarters as a probationary student. Students are dismissed from the college upon failing to achieve satisfactory academic standing in the required period of time or if the student has a second probationary event. A student must achieve an A or B grade in all required clinical nursing courses. If lower than a B grade is earned, a student may repeat the one course with the approval of the Progressions Committee. An F, N or WF grade in any course is grounds for dismissal from the program. Graduate students will be required to receive a grade of B or higher in graduate seminars designated by the program of study for their area of concentration. If a C grade is achieved in a single clinical seminar course or a single clinical practicum, the student must repeat the course prior to graduation. A student may only repeat one clinical seminar or clinical practicum in a program of study. A grade of F, WF or a second C in a required clinical seminar or clinical practicum will result in dismissal from the program. An F, N or WF grade in any required course places the student on academic probation and is grounds for dismissal from the program. Permission may be given to retake a course at the discretion of the Progressions Committee. If permit-

ted, a student has only one opportunity to achieve a passing grade. An F, N or WF grade in the repeated courses will result in dismissal. (Please refer to the Student Advising Handbook for complete information regarding these policies.)

All students awarded a degree or certificate must be in good academic standing upon completion of their program.

Transfer of Credit. Undergraduate courses taken at an accredited college or university that fulfill the prerequisites for admission may be applied toward the baccalaureate degree. Elective credit required at Rush may be fulfilled by upper-division courses taken at another institution. Upper-division courses must be at the 300 or 400 level, or their equivalent, and academic in nature. For instance, courses in physical education or applied arts are not accepted. A Petition for Transfer of Credit form must be completed for each course. Courses at the undergraduate level must have a grade of C or better to be eligible for transfer. Graduate credit earned elsewhere may be applied to the M.S.N., N.D. and D.N.Sc. degree requirements at Rush subject to the approval of the advisor and the Associate Dean. Credits in excess of 55 quarter hours, to be applied to the D.N.Sc., require approval of the Associate Dean. Before these credits may be approved to meet degree requirements, a Petition for Transfer Credit form must be completed. The form should be completed during the first quarter of enrollment in the degree program. Courses at the graduate level must have a grade of B or better in order to qualify for transfer. This includes courses taken at Rush under unclassified status. After matriculation, students who plan to request credit for courses taken elsewhere must complete a Petition for Transfer Credit form available in the Office of the Registrar or on-line at the Office of the Registrar's web site, www.rushu.rush.edu/registrar.

Prelicensure Enrollment in Graduate Courses. With permission, prelicensure students may register for graduate level courses. Any credit earned in this manner will automatically apply toward the baccalaureate degree. Should any undergraduate student later apply for and gain admission to a graduate program at Rush University, the student may request that the graduate credit earned be applied toward the master's degree. A transfer credit approval form should be completed. Credit will transfer in this manner only if the student has enough cumulative credits. A student must earn a minimum of 180 quarter hours to receive the Bachelor of Science in Nursing degree. Thus, if a student actually earned 187 quarter hours, and seven quarter hours are at the graduate level at Rush, seven quarter hours could potentially be credited toward the master's degree.

Credit by Examination. A student who passes a proficiency examination at Rush will earn academic credit toward the degree. The credit will equal the credit value of the course as listed in the current University Bulletin. Information that is posted on the transcript is the course prefix and number, title, credit value and "K" grade. A transcript guide that accompanies all transcripts issued by the Office of the Registrar explains that the "K" grade means credit was earned through proficiency examination. Credit for the course will appear in the quarterly and cumulative totals as credit earned. The credit is not calculated into the student's GPA. A fee for the examination is assessed based on the number of credits assigned to the course. The credit by examination process is initiated through the Office of the Associate Dean in the College of Nursing.

Incomplete Grades. The grade of incomplete ("I") is given only when circumstances beyond the control of the student prevent completion of course requirements and the student is given permission to defer completion of these unmet course requirements. The course director will determine what work is required to remove the incomplete and will establish a specific time within which the student must complete such work. Students may request a grade of "incomplete" from a course director. If the course director grants the privilege of an incomplete, the "I" grade must be removed by the end of the next quarter or as negotiated with the course director, or it will revert to a permanent failing (F or N) grade. A student receiving a grade of "I" in a course may not begin another course for which the incomplete course is a prerequisite. Students may not register for new courses if they have two or more incomplete grades (i.e., registration in NUR 999, Continuous Enrollment, is required to finish the incomplete work and receive a grade). A grade of incomplete does not reflect upon the quality of the student's performance. Upon the completion of the unmet course requirements this grade will be replaced by the new grade.

Absences. Students are responsible for all material presented in class sessions. Students are expected to be in attendance at all classes and clinical practice periods and are responsible for all content presented therein. When illness or other exceptional circumstances prevent attendance, the student is responsible for contacting the instructor (in advance, if possible) to plan for meeting the objectives on an individual basis. Students absent from an examination are responsible for notifying the course director according to the guidelines specified in the course syllabus. Failure to do so may result in a zero for that examination or an incomplete for the course as determined by the course director.

Examination Policy. The examination policy is the responsibility of the individual course director who will inform students of examination requirements for that particular course. A period at the end of the quarter is provided for examinations. This period may be used as the course director requires.

Leave of Absence. A student who must interrupt his/her studies for reasons of sustained ill health or compelling personal situations may apply for a leave of absence for a stated period of time, not to exceed four consecutive quarters. A College of Nursing Petition for Leave of Absence form must be completed and all authorized signatures obtained by the student and submitted to the Office of the Registrar by Friday of the first week of the quarter in which the leave begins. Leaves of absence for one quarter are approved by the advisor and the Associate Dean. Leaves for two to four quarters must be approved by the Progressions Committee as well. If approved by the committee and the Associate Dean, the student must satisfy the conditions of the leave before re-entering and must comply with all policies, requirements and course sequences in effect at the time of reentry. Registration for the quarter of return is the sole responsibility of the student. Students on leave are responsible for checking the "online Timetable" (www.rushu.rush.edu/registrar) or calling the Office of the Registrar (312) 942-5681, regarding the dates for registration of "continuing students" and consulting their advisors about their course schedule prior to returning. The student must notify the advisor of his/her intent to return no later than the fifth week of the quarter prior to re-enrollment. A student is allowed a maximum of eight quarters of leave during the completion of any one degree option. (See Academic Information section for additional requirements).

Readmission. Any student who has withdrawn from a program or has not been enrolled for one or more quarters or any dismissed student may apply for readmission by submitting an application for this purpose to the Office of College Admissions Services. Applications for readmission must be received at least six weeks before the planned return. An interview may be required. A student accepted for re-enrollment must meet the conditions for re-enrollment stated in his/her dismissal or re-entry acceptance letter and must follow all policies and meet any requirements and course sequences for the degree pursued that are in effect at the time of re-entry. The student will pay tuition and fees at the rates in effect at the time of re-enrollment. Nursing students who received an unacceptable grade in a course, which resulted in dismissal, must repeat the course upon their reinstatement. The hour and grade points of the second grade only will be counted in the cumulative GPA.

Graduation Requirements. The B.S.N. requires a minimum of 180 quarter hours. At least 90 quarter hours must fulfill the pre-health curriculum. The remaining 90+ quarter hours constitute the upper-division curriculum. Candidates for the B.S.N. degree must earn a 2.0 cumulative GPA in all required nursing courses. A 2.0 cumulative GPA must be earned in all computed upper-division credits taken at Rush. B.S.N. candidates must pass an "End of Program" examination. A minimum of 45 quarter hours will be spent as an upper-division student in academic residence at Rush. Graduates are eligible to write the National Council Licensure Examination for Registered Nurses. R.N.'s completing the baccalaureate degree must complete 36 hours in residence at Rush. Credit earned through proficiency examination may not be used to meet this requirement. Participation in commencement is expected of all graduates. All graduate nursing and R.N.-B.S.N. students at the end of the quarter in which they graduate must complete a Degree Approval Form to clear the college and university. Diplomas will not be distributed before the Degree Approval Form has been completed.

Master of Science in Nursing. Requires a minimum of 55 quarter hours and must include all coursework and residencies required for the selected area of concentration. No fewer than 28 quarter hours shall be spent in residence at Rush University for the M.S.N. degree. Part-time master's students must complete degree requirements within five years.

Doctor of Nursing. Requires a minimum of 39 quarter hours of post-master's study. Part-time doctor of nursing students must complete degree requirements within five years.

Doctor of Nursing Science. Requires completion of the approved individual program of study. Coursework for the D.N.Sc. must be the equivalent of 125 quarter hours of graduate credit in addition to the completed dissertation. No fewer than 63 quarter hours of post-baccalaureate study shall be spent in residence at Rush University for the D.N.Sc. degree. No fewer than 35 quarter hours of post-master's study shall be spent in residence at Rush University for the D.N.Sc. degree. D.N.Sc. (post-master's) students must complete degree requirements within eight years.

Commencement. Commencement is held annually at the end of the Spring quarter. Students from the College of Nursing are permitted to participate in the ceremony if they complete degree requirements in the preceding fall, winter or spring quarters. Students who will complete degree requirements in August, with the exception of doctoral candidates, may participate in the preceding June ceremony. D.N.Sc. candidates may participate in commencement ceremonies only when all required signatures have been obtained on the Degree Approval Form and the form submitted by the specified deadline. Doctor of Nursing (N.D.) students must have completed all coursework and have the signed Doctor of Nursing Project Approval Form to the Office of the Registrar by the end of the Spring quarter in order to be eligible to participate. The Office of Students Affairs contacts eligible students about participation in commencement.

* Additional policies are listed in the Academic Information section.

Policies Concerning Student Misconduct

Purpose
The purpose of the student misconduct process is to investigate and adjudicate charges of student misconduct including but not limited to: violations of commonly accepted ethical standards of an academic community such as cheating and plagiarism; falsification of student records, transcripts, financial aid forms, or applications; unlawful use or possession of controlled substances on the Medical Center campus; conviction of a crime deemed serious enough to render the student unfit to pursue his or her profession; or other conduct which is inconsistent with generally accepted standards of behavior within an academic community or the nursing profession.

Step I
All charges of alleged student misconduct shall be presented in writing to the Associate Dean.

Step II
The Associate Dean reviews the charge and related materials. This review may include interviews with the individual(s) who initiated the charge or have some relationship in the matter. If the Associate Dean determines that the charge is not to be treated as misconduct, she/he may resolve the matter on its own merit. Alternatively, if the Associate Dean determines that the charge should be upheld and treated as misconduct, she/he may resolve the issue or refer the charge to the Faculty Senate by notifying the presiding officer. In the latter case, the Associate Dean will notify the student in writing by certified mail and the complainant as to the resolution or referral of the charge, within ten working days of receiving the compliant. The Associate Dean will place a copy of this letter in the student's file. In the event that the individual(s) initiating the charge of the student or the student charged with misconduct do not agree with the resolution of the Associate Dean, the individual(s) and/or the student may exercise the right to have the charge heard by Faculty Senate by notifying the presiding officer of the Faculty Senate within ten working days of receiving the certified letter.

Step III
Within ten working days after notification, the Senate shall meet and submit a written recommendation to the Dean.

Formal rules of evidence shall not be applicable. Evidence presented should be reasonably related to the issues before the Senate and shall not be unduly repetitious. All evidence shall be admissible unless clearly redundant.

Both the student and the Senate may be accompanied by legal counsel or other person at the hearing. However, the accompanying legal counsel or other person may not participate in the actual hearing proceedings.

At any time prior to the hearing conference, the student may, if he or she believes that a bias or conflict of interest exists, request in writing the disqualification from the proceedings of any member of Senate. The final determination on such requests for disqualification is to be made by the presiding officer of Senate prior to the hearing. The presiding officer of shall, without request, disqualify any member of the Senate who shall or has given testimony as a witness in this hearing. Any member of the Senate may disqualify him or herself from the proceedings on the grounds of bias or conflict of interest in the proceeding. If disqualification of the presiding officer is requested, the Senate shall consider and vote on the request. Disqualification of the presiding officer shall require the endorsement of a majority of Senate members voting. If the presiding officer is so disqualified, a new presiding officer for the proceedings shall be elected by the Senate. The reasons for all challenges and for voluntary disqualification shall be made a part to the record.

In the event that the hearing cannot be completed before the end of the current Senate term, the members of the Senate participating in the hearing shall retain their positions and voting privileges with respect to the pending hearing, but shall not retain their positions or voting privileges for any other Senate purposes.

Step IV
Within five working days or as soon thereafter as possible following receipt of the Senate's recommendation, and upon discussion with the student and others as appropriate, the Dean shall reach a final decision and notify each party of the decision. The decision reached by the Dean is final. Penalties may include: a warning, probation, suspension, or dismissal from the University/Medical Center.

* Complaints resulting in no action by the College will not be retained in the student's official college file. Minutes of the hearing will be kept.

Faculty Senate

Faculty Senate shall consider evidence in the form of documentary evidence, written statements, or oral testimony from the student and/or such other relevant witnesses as may be called by the Senate or the student. To reach a decision on the appeal, the Senate must be satisfied by simple majority vote, a quorum (i.e., a simple majority of voting members) being present, that the preponderance of the evidence establishes that there was or was not adequate cause to support the charge of misconduct. Senate members who are not present at the hearing cannot be part of the deliberations nor can they vote on the outcome of the hearing.

Student Conduct and Academic Honesty

See the "University Statement on Academic Honesty" in the General Information section and the College of Nursing Student Advising Handbook.

College of Nursing Committees

Faculty Senate. This is the governing body for the faculty and operates as the Committee on Committees. The senate has ten members representing each academic rank level, as well as members from the faculty-at-large. Members of this body are elected annually and the senate elects its own chairperson. Two student representatives also serve on the senate.

Standing Committees

The standing committees of the College of Nursing assist with the work of the college. Members of the committees are elected by the total faculty every June. The committees include the following:

Admissions/Progressions Committee. This committee is responsible for the review of all applicants to the College of Nursing and maintaining the admission standards and policies for all nursing programs. This joint committee is also charged with oversight of the progression standards and policies for all nursing programs, and for the progress and performance review of all students. There are twelve members on this committee.

Curriculum. There is a curriculum committee for the undergraduate program and also one for the graduate program. These committees serve as the monitoring resource for the curriculum. The committees review all new courses and/or major changes in the curriculum, establish and monitor methodology for curriculum evaluation and provide overall consistency for curriculum development. There are six members on each committee plus one student voting member.

Committee on Cultural Diversity. This committee is involved with the recruitment and retention of students and faculty from minority groups and data collection and research in relation to affirmative action activities and progress. There are five members on this committee, including two student representatives.

Evaluation Committee. The committee is responsible for coordinating procedures pertaining to all aspects of program evaluations. There are seven faculty members and two student representatives.

Faculty Appointments and Promotions Committee. This committee acts upon the appointments and promotions of faculty in accordance with the Rules for Governance. There are six members on this committee, representing junior and senior faculty members.

Student Misconduct Committee. This committee investigates and adjudicates charges of student misconduct. The Associate Dean and Faculty Senate are responsible for resolving issues of student misconduct.


RUSH UNIVERSITY
COLLEGE OF HEALTH SCIENCES - CHICAGO - 1975
TRUTH
TO DISCOVER
AND SERVE

"The faculty of the College of Health Sciences, through the unification of their academic and operational responsibilities, strive to develop leaders for the future of health care in an array of the allied health professions and management. The hallmarks of scholarly excellence are the excitement of discovery, its communication to others and its application to the field. With faculty and students as colleagues, these are what we seek at Rush."

John E. Trufant, Ed.D.
The Catherine and R. Winfield Ellis-Philip N. Jones, M.D.,
Professor of University Affairs;
Dean, College of Health Sciences;
Vice President, Academic Resources

The College

The College of Health Sciences, founded in 1975, is responsible for education and research in the allied health professions, including management. More than six of every ten health care workers in the United States is in allied health. Over fifty separate categories of professionals comprise this largest segment of the health care workforce. The faculty of the College of Health Sciences serve the Medical Center as practitioner-teachers. Nearly all have patient care or service responsibilities while concurrently filling academic roles as teachers and investigators. Through the faculty, therefore, the students have access to the latest treatment and practice patterns of skilled clinicians and managers in a dynamic academic health center.

Mission

The College of Health Sciences, through a practitioner-teacher model, provides high quality academic programs in the health professions to meet the emerging needs of the health care system. The College's leadership, faculty, students and staff seek continuously to improve in all of their responsibilities. The primary purposes of the College are to:

- Enhance patient care services,
- Educate and train health care professionals,
- Advance health care knowledge through scholarship and research,
- Contribute to the communities of which the Medical Center is a member, and
- Foster the individual growth and satisfaction of the faculty, students and staff of the College.

Organization

The organization of the College of Health Sciences centers around departments and programs, each headed by a department chairperson/program director who report to the College dean. The senior representative policy body of the College is the Faculty Council, comprised of two faculty members from each department. Meetings of the Council are ordinarily held quarterly. Faculty may propose agenda items, and guests are welcome by invitation. The departments/programs of the college, each described later in this section, include Clinical Laboratory Sciences, Perfusion Technology, and Vascular Ultrasound which offer bachelor of science degrees. Six departments offer master of science degrees: Communication Disorders and Sciences, Clinical Nutrition, Health Systems Management, Medical Physics, Occupational Therapy, and Religion, Health and Human Values, which also offers internships in clinical pastoral education and a certificate program in health care ethics and health care and spirituality. The Section of Ethics is also organized as part of this department. The Department of Communication Disorders and Sciences offers the Doctor of Audiology degree.

Alumni Activities

The College encourages the development of strong ties with its graduates. All graduates are considered alumni of Rush University, and no dues are levied. Each of the programs in the College of Health Sciences has its own alumni association.

Academic Policies*

Credit Hours. Rush University is on a quarter system. Each quarter is at least ten weeks in length. An examination period is provided at the end of each term and most instructors give a final examination during this time. The quarter hour is the unit used by the College of Health Sciences to determine credit for courses taken. As a general rule, one quarter hour represents contact time of one lecture hour, two hours of small group discussion or three laboratory or clinical hours per week.

Transfer of Credit. Undergraduate courses taken at an accredited college or university that fulfill the prerequisites for admission may be applied toward the baccalaureate degree. Graduate credit earned elsewhere may be applied to the master of science degree requirements for Rush, subject to the approval of the department. Before this credit may be approved to meet degree requirements, a Petition for Transfer of Credit form must be completed. The form should be completed during the first quarter of enrollment in the degree program. After matriculation, students who plan to request credit for courses taken elsewhere must either complete the Petition for Transfer Credit form or register for concurrent enrollment. Information regarding either of these options is available in the Office of the Registrar. Prior approval of the department chairperson is required. The amount of credit allowable for transfer may be limited.

Credit by Examination. A student who passes a proficiency examination at Rush University will earn academic credit toward the degree. The credit will equal the credit value of the course as listed

in the current Rush University Bulletin. Information that is posted on the transcript is the course prefix and number, title, credit value, and a K grade. A transcript guide that accompanies all transcripts issued by the Office of the Registrar explains that the K grade means credit was earned through proficiency examination. Credit for the course will appear in the quarterly and cumulative totals as credit earned. The credit is not calculated into the student's grade point average (GPA).

Full-time and Part-time Enrollment. Twelve quarter hours is considered full-time enrollment. Registration for fewer than twelve hours constitutes part-time enrollment.

Undergraduate Enrollment in Graduate Courses. With permission, undergraduate students may register for graduate level courses. Any credit earned in this manner will automatically apply toward the baccalaureate degree. Should an undergraduate student later apply for and gain admission to a graduate program at Rush University, the student may request that the graduate credit earned be applied toward the master's degree. A Petition for Transfer of Credit form should be completed. Forms are available from the Office of the Registrar or from the web site (www.rushu.rush.edu/registrar). Credit will transfer in this manner only if the student has enough cumulative credits. A student must earn a minimum of 180 quarter hours to receive the bachelor of science degree. If a student actually earns 187 quarter hours for example, and seven quarter hours are at the graduate level at Rush, seven quarter hours could potentially be credited toward the master's degree.

Incomplete Grades. The grade of incomplete ("I") is given only when circumstances beyond the control of the student prevent completion of course requirements and the student has received permission from the course director to defer completion of these unmet course requirements. The course director determines what work will be required to remove the incomplete and establishes a specific timeframe within which the student must complete such work. An incomplete grade does not reflect upon the quality of the student's performance, and upon completion of the unmet course requirements, this grade will be replaced by the new grade.

Undergraduate Students. Students receiving grades of incomplete are responsible for asking the instructor for the exact work required to remove the incomplete. The "I" grade must be removed by the end of the next quarter or it will revert to a failing (F or N) grade unless otherwise approved by the course director. If the student is not enrolled in other courses while completing the incomplete, the enrollment fee is imposed.

Graduate Students. Graduate students may request an incomplete from the course director. An incomplete grade not removed by the end of the next quarter will revert to a final grade as determined by the course director. If the student is not enrolled in other courses while resolving the incomplete, the enrollment fee is imposed.

* See Academic Information section for additional information.

Absences. Students are responsible for all material presented in class sessions. Faculty members are not obligated to provide extra help to students who miss or arrive late to classes. When illness or other special circumstances prevent attendance, the student is responsible for contacting the instructor (in advance, if possible) to plan for meeting the objectives on an individual basis. Students absent from an examination are responsible for notifying the course director according to the guidelines specified in the course syllabus. Failure to do so will result in a zero for that examination or an incomplete for the course as determined by the course director. Faculty may require class attendance as a matter of policy.

Examination Policy. The examination policy is the responsibility of the individual course director who will inform students of examination requirements for that particular course. A period at the end of the quarter is provided for examinations. This period may be used as the course director chooses.

Thesis. Several programs in the College of Health Sciences either require or have an option for a thesis project. Completing one's thesis is a significant academic accomplishment and acknowledges that the student has conducted an independent scientific investigation that will add to the knowledge in his/her field. All students are required to have their theses registered with University Microfilms, Inc. This process includes the publication of the thesis abstract, the microfilming of the thesis, and the copyrighting of the work. In addition, the original copy of the thesis is bound and becomes a permanent part of the collection of the Library of Rush University. The director of the Library of Rush University Medical Center coordinates the process.

Leave of Absence. A student who must interrupt his/her studies for reasons of sustained ill health or compelling personal situations may apply for a leave of absence for a stated period of time, not to exceed four quarters. A Petition for Leave of Absence form (available from the Office of the Registrar or from the web site (www.rushu.rush.edu/registrar)) must be submitted to the department chairperson or his/her designate. If approved by the department chairperson and dean, the student must satisfy the conditions of the leave before re-entering and must comply with all policies, requirements, and course sequences in effect at the time of re-entry. The student will pay tuition and fees at the rate in effect at the time of re-enrollment.

Readmission. Any student who has withdrawn from a program or has not been enrolled for one or more quarters or any dismissed student may apply for readmission by submitting an application for this purpose. Applications for re-enrollment must be received at least three months before the planned return. An interview may be required. A re-entering student must meet the conditions for re-enrollment stated in his/her dismissal or re-entry acceptance letter and all policies, requirements, and course sequences in effect at the time of re-entry. Previously enrolled students may be considered as part of the pool of new applicants and are not guaranteed admission. The student will pay tuition and fees at the rates in effect at the time of re-enrollment.

Student Appeals Process. A student wishing to appeal an academic decision should follow the process summarized below, in the sequence indicated.

1. Discuss and attempt to resolve the issue with the faculty member in question.
2. Discuss the issue with the department chairperson (or with the program director, if applicable).
3. Submit a written appeal to the student progress and promotion committee of the department.
4. Submit written request for a hearing to the College Dean.

College Committees

The senior representative governing body of the College of Health Sciences is the Faculty Council. Its membership is comprised of faculty members representing all departments and ranks. The Committee on Senior Faculty Appointments and Promotions recommends all promotions and appointments of faculty to senior ranks. It is elected by the faculty and has representatives from all departments in the college.

Department of Clinical Laboratory Sciences

Philosophy

The contribution of clinical laboratory sciences to patient care and to the health delivery system is primarily one of diagnostic services. The increasing number and wide range of diagnostic tests performed by clinical laboratory scientists/medical technologists requires frequent adaptation to new laboratory methodologies and instrumentation. Clinical medicine requires today's clinical laboratory scientist/medical technologist to be a highly qualified professional who is willing and able to expand and extend his/her theoretical knowledge and technical skills. Today's professional clinical laboratory scientists must develop technical expertise as well as teaching and administrative competence. They must be able to adapt to rapid changes in the field while maintaining an optimal level of performance. As a member of the health care team, the clinical laboratory scientist/medical technologist must have a basic understanding of the role of other health practitioners to function effectively and provided the best possible care. Although work in clinical laboratory sciences often does not place the practitioner in direct contact with the patient, the clinical laboratory scientist/medical technologist must maintain compassion and empathy and accept the patient's welfare as the highest priority.

Programs

The Department of Clinical Laboratory Sciences offers three degree programs; the Bachelor of Science, major in Clinical Laboratory Sciences; Master of Science, major in Clinical Laboratory Sciences; and Master of Science, major in Clinical Laboratory Management. The department also offers a specialized career mobility option for certified clinical laboratory technicians/medical technicians. Certified CLTs/MLTs can complete the bachelor's program in four quarters. Entry into the program requires additional prerequisite coursework in addition to an associate of science degree and CLT/MLT certification.

Bachelor of Science Program

It is the aim of the baccàlaureate program to educate clinical laboratory scientists to effectively meet the changing needs of laboratory medicine.

Educational Goals. Graduate competent practitioners who possess the skills and knowledge to function at an optimal level in various clinical laboratory settings.

- Graduate competent laboratorians who can meet the changing needs of the profession.
- Foster and develop critical thinking and problem solving.
- Instill the highest degree of professionalism.
- Instill and foster a high degree of professional ethics.
- Promote the importance of continuing education and professional association participation.

Functional Expectations for Students. The following is an outline of the expectations for students enrolled in a Clinical Laboratory Sciences degree program. This information is provided so students can be knowledgeable about performance skills that are expected during coursework and clinical rotations, and also to allow students to determine whether accommodations may be needed due to a disabling condition.

Each student is expected to perform the following, with or without reasonable accommodation. Reasonable accommodation is defined as any change in the environment or in the way activities are usually done that enables an individual with a disability to participate as fully as possible in the academic program. Accommodations may include modification of policies, practices and procedures or the provision of auxiliary aids for communication. Students must not pose a threat to the safety or well-being of patients, other students, staff, or themselves.

1. **Observation:** The students must be able to observe demonstrations and exercises in the medical laboratory sciences involving body fluids and products being tested for biochemical, hematologic, and microbiologic constituents, including the use of simple and complex instruments and microscopes.
2. **Communication:** The student must be able to communicate clearly and sensitively with patients and family members. The student must be able to communicate effectively and efficiently with all members of the health care team.
3. **Motor:** Students must be able to perform tasks using laboratory instruments and glassware dealing with specimen collection and test analysis.
4. **Intellectual-Conceptual, Integrative and Quantitative Abilities:** These intellectual abilities include measurement calculations, reasoning, analysis and synthesis. Problem solving is a critical skill requiring all of these intellectual abilities.
5. **Behavioral and Interpersonal Attributes:** Students must possess the emotional health required for full utilization of intellectual abilities. This includes, but is not limited to, the exercise of good judgment and the prompt completion of all responsibilities attendant to the performance of procedures with maximal attention to safety of self and others in dealing with potentially hazardous equipment and materials. Students must be able to tolerate periods of taxing workloads and function effectively under stress and with unpleasant materials. They must be able to adapt to changing environments, to display flexibility, and learn to function in the face of uncertainties inherent in the clinical problems that come to the laboratory. Compassion, integrity, concern for others, interpersonal skills, interest and motivation as well as the ability to maintain confidentiality of patient results, are all personal qualities that will be assessed during the education process.
6. **Academic Performance:** The student must obtain information from lectures, laboratory sessions/exercises, audiovisual materials and written materials. Students must take essay and multiple choice tests, complete papers, deliver presentations and perform required lab practice.

A request for accommodation or modification is not cause for withdrawal of the offer of acceptance. Any student can request accommodations once enrolled in the program. If an accommodation is requested, the department may require additional documentation and information, and will follow up with the student to discuss the specifics of the request and the appropriate plan of action.

Specific Program Outcomes. Graduates are expected to demonstrate entry-level competence in the following areas:

1. Know procedures for proper specimen collection and processing of biological specimens.
2. Know all safety regulations for the proper handling of chemical and biological specimens.
3. Be able to perform, with a high level of competence, analytical tests on body fluids, cells and blood products.
4. Establish procedures for, and perform preventive and corrective maintenance on equipment and instruments.
5. Integrate and relate data generated by various clinical laboratory departments while making judgements regarding possible discrepancies and adherence to quality control protocols.
6. Evaluate the adequacy with which decisions are made from clinical data.
7. Evaluate new techniques and incorporate new procedures into daily laboratory operation.
8. Demonstrate professional conduct and interpersonal skills with patients, fellow employees, other health-care providers and the public.

The Clinical Laboratory Sciences program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), 8410 West Bryn Mawr Avenue, Suite 670, Chicago, Illinois 60631-3415. (773) 714-8880.

The Clinical Laboratory Sciences professional program consists of two parts: didactic (classroom learning) and clinical (practice in the clinical laboratory). After the completion of the program, graduates usually take a national certification/registration and licensure examination (in certain states).

The student's ability to begin the clinical portion of the program and to complete certification/registration and licensure requirements for entry into the profession may depend on documentation of such things as drug screening, a background check for a history of criminal offenses and psychiatric screening. Students are NOT required to disclose this information to the program unless the clinical rotation site requires such disclosure. Disclosure may be required for specific circumstances of employment.

In addition, students are prohibited from using academic or professional credentials until the satisfactory completion of a degree and appropriate credentials are awarded.

Admission - Bachelor of Science Program

Students applying to the clinical laboratory sciences program may do so in one of two ways. Students may attend either an accredited college of their choice or one of the colleges affiliated with Rush University that offers preparation for clinical laboratory sciences. All applicants must complete the pre-professional requirements. An overall GPA of 2.5 on a 4.0 scale is required. Three letters of recommendation must be submitted with the University application. Students are accepted at the beginning of any quarter, although fall admission is recommended. In addition to fulfillment of academic requirements, a personal interview, conducted by members of the Admission Committee, is required for admission. Interviews are behaviorally oriented and take about an hour. Questions focus on commitment, problem-solving ability, team interaction and initiative. Applicants are asked for life experience situations in which these behavioral characteristics are demonstrated. At the time of the interview, each applicant is also asked to write a short essay. Essays are evaluated for grammar, spelling, content and overall quality of written communication. Applications are ranked on the basis of grades in prerequisite courses, references, interview results and the written essay. Applicants who have taken their prerequisite coursework at a university outside the United States must have their coursework evaluated by the Education Credentials Evaluators (ECE). TOEFL and TSE scores must be submitted.

Associated colleges offering preparation for clinical laboratory sciences:

Beloit College, Beloit, Wis.
Carleton College, Northfield, Minn.
Dominican University, River Forest, Ill.
Fisk University, Nashville, Tenn.
Knox College, Galesburg, Ill.
Lawrence University, Appleton, Wis.
Monmouth College, Monmouth, Ill.
North Central College, Naperville, Ill.
Ripon College, Ripon, Wis.

Documentation of Hepatitis-B Virus Vaccination: Before students are allowed to begin the program, they must have on file documentation that they have either begun or have finished the course of inoculations for the Hepatitis-B virus. This documentation should be sent to the Program Director or his/her designate. If the student has just begun, but has not yet finished, the series of inoculations at the start of the program, they must provide documentation that they have finished the course of inoculations as soon as possible in order to remain in the program. This information will be reviewed quarterly. In addition, the University has specific immunization requirements, which must be met before admission into the program.

Documentation of Tuberculosis Testing: All students must provide the results from a tuberculosis test in order to begin the program. Students should thereafter be tested annually for tuberculosis and should submit the results to the Program Director or his/her designate. Failure to comply can lead to dismissal from the program.

Curriculum

Pre-professional Program. The pre-professional curriculum for the clinical laboratory sciences program is taken at an associated college or other accredited college or university and requires two to three years of study, depending upon the college. These years are devoted to preparing the scientific foundation upon which the practice of clinical laboratory science can be built. The first year emphasizes courses in biological, physical, and behavioral sciences, with options in the humanities. The succeeding years are

used to increase depth in the sciences as they relate more specifically to health fields and to enhance personal experience by a broad choice of electives in the humanities. Specific courses offerings and requirements may vary from campus to campus due to curriculum offerings, scheduling, and course content. The following courses are required before a student comes to the Rush campus:

Chemistry (including Organic and Quantitative Analysis)
Biology (including Microbiology)
Mathematics (Algebra and Statistics)

Professional Program. Students integrate the theory of clinical science with the practice of clinical laboratory procedures, learning basic theory and skills in hematology, clinical chemistry, immunology, immunohematology, molecular techniques and clinical microbiology in the first year, going on to more advanced courses in those areas in the second year. Students apply basic concepts as they rotate through the laboratories of Rush University Medical Center and affiliated hospitals. Additionally, students are prepared for supervisory and teaching positions through courses in management and education.

Academic Policies

Academic Progression: High academic performance in required courses is expected. Students will be considered in good standing at Rush University unless placed on academic probation. A cumulative grade point average of at least 2.0 for undergraduate students and 3.0 for graduate students is required to continue in the program. Cumulative grade point averages will be reviewed after each quarter. A grade of "F" in an undergraduate level course must be repeated and a grade of "D" or less in a graduate level course must be repeated. The faculty reserves the right to request the withdrawal of a student whose conduct, health, or performance demonstrates lack of fitness for continuance in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University.

Academic Probation: Academic probation is assigned to any student who receives a quarterly grade point average below 2.0 for undergraduate students and below 3.0 for graduate students, or whose cumulative grade point average falls below 2.0 for undergraduate students and 3.0 for graduate students. Students placed on probation have two quarters in which to regain the status of good standing. Failure to do so will result in dismissal from the University.

Final Grades: The Evaluations and Promotions Committee must approve all final grade changes after review by the Program Director. Each instructor determines the grading scale of his/her course according to guidelines developed by the department. It is the responsibility of the student to become familiar with all requirements as contained in the course modules given at the beginning of each course. A grade of "P" or "N" can be given for elective courses when approved by the Department Chairman.

Clinical Practicum Grades: All work in practicum courses must be at the "C" level or better for undergraduate student and at the "B" level or better for graduate students. A "D" grade for undergraduates and a "C" grade for graduates in such a course must be repeated. Practicum courses may be repeated only once and must be taken within one year with the new grade replacing the "D" or "C" in the cumulative grade point average. A second grade of "D" for undergraduates or "C" for graduate students in any practicum course will result in dismissal from the program.

Incomplete Grades: The grade of incomplete (I) is normally given only when circumstances beyond the control of the student prevent completion of course requirements and the student have received permission to defer completion of these unmet course requirements. Students receiving a grade of "I" are responsible for finding out from the instructor the exact work required to remove the incomplete. For a required course, work shall be completed and a letter grade received by the end of the next quarter or sooner at the discretion of the instructor. An "I" grade not removed by the end of the quarter will revert to a final grade as determined by the course director. A grade of incomplete in a course will automatically revert to an "F" or "N" grade unless a change of grade is received by the Office of the Registrar within one calendar year. A grade of "I" in a clinical rotation must be completed before, or by the end of, the summer in which the student is scheduled to graduate. An incomplete grade does not reflect upon the quality of the student's performance, and upon completion of the course requirements, this grade will be replaced by the new grade. Please refer to the Academic Information section in the Rush University Bulletin for additional requirements. If the student is not enrolled in other courses while resolving the incomplete, the enrollment fee is imposed (refer to the Financial Affairs section in the Rush University Bulletin).

Midterm Warning Notices: Students not maintaining a pass level grade at midterm time will be given a warning notice. It is the student's responsibility to contact the course instructor immediately to ascertain how the grade can be improved.

Absences: It is expected that students will attend all lecture and laboratory sessions. Students are responsible for all material presented in class sessions. Faculty members are not obligated to provide extra help to students who miss or arrive late to classes. When illness or other special circumstances prevent attendance, the student is responsible for contacting the instructor (in advance, if possible) to plan for meeting the objectives on an individual basis. Students absent from an examination are responsible for notifying the course director according to the guidelines specified in the course syllabus. Failure to do so can result in a zero for that examination or an incomplete for the course as determined by the course director. If the student is unable to attend a lecture or laboratory session, he/she has the responsibility of calling the Clinical Laboratory Sciences Office at (312) 942-2111 or individual instructors and informing them of his/her absence. Attendance is mandatory in the clinical rotations. Absences can result in lower grades at the discretion of the instructor. For clinical rotations, the student must inform the instructor of his/her absence.

Comprehensive Examination: Students in the bachelor's and master's degree programs in clinical laboratory sciences must take and pass a comprehensive examination at the end of the program in order to graduate from the Clinical Laboratory Sciences Department. Students who fail the exam must retake the exam until they pass. Diplomas will not be given until the student has passed the comprehensive examination. Students are not eligible to take the national certification examinations until all degree requirements are met. Verification of degree completion is required from the program director by the American Society of Clinical Pathology Board of Registry.

Certification. The comprehensive technical curriculum at Rush University prepares the student to enter the practice of clinical laboratory sciences/medical technology. Graduates are eligible to take the Medical Technologist certification examination given by the American Society of Clinical Pathology, and the Clinical Laboratory Scientist certification examination given by The National Credentialing Agency for Laboratory Personnel, and upon passing these examinations, they become certified as Medical Technologists, MT(ASCP) and as Clinical Laboratory Scientists, CLS(NCA).

Graduation Requirements

The **Bachelor of Science** degree in Clinical Laboratory Sciences requires a minimum of 180 quarter hours. This includes at least 90 quarter hours earned at a lower-division college or university or at an affiliated college. A minimum of 45 quarter hours of academic credit shall be earned as an upper-division student in academic residence at Rush University. Candidates for the bachelor of science degree must earn a 2.0 cumulative grade point average in all computed upper-division credits taken at Rush University. Participation in commencement exercises is expected of all graduates.

The **Master of Science** degree in Clinical Laboratory Sciences requires a minimum of 90 quarter hours. Candidates for the Master of Science degree must earn a 3.0 cumulative grade point average in all computed upper-division credits taken at Rush University. A minimum of 45 quarter hours of academic credit shall be earned as a graduate student in academic residence at Rush University. Participation in commencement exercises is expected of all graduates.

Curriculum

First Year

Fall Quarter		(Total Qtr. Hours: 18)
CLS 301/501	2	Laboratory Fundamentals
CLS 302/502	5	Clinical Chemistry I
CLS 311/511	5	Hematology I
CLS 319/519	2	Serology
CLS 331/531	3	Immunology
MTK 311/511	1	Professional Development I

Winter Quarter		(Total Qtr. Hours: 15)
CLS 321/521	5	Microbiology
CLS 303/503	3	Clinical Chemistry II
CLS 317/517	2	Hemostasis
CLS 312/512	4	Body Fluid Analysis
MTK 312/512	1	Professional Development

Spring Quarter		(Total Qtr. Hours: 15)
CLS 304/504	3	Clinical Chemistry III
CLS 332/532	5	Immunohematology
CLS 461/561	2	Regulatory Issues
CLS 322/522	5	Parasitology, Mycology and Virology

Summer Quarter		(Total Qtr. Hours: 12-16)
CLS 441/541	5	Molecular Techniques
MTK 403/503	3	Supervision and Education
	4-8	Clinical Rotations*

Second Year

Fall Quarter		(Total Qtr. Hours: 15)
CLS 406/506	3	LIS and LAS
CLS 442/542	2	Case Studies I
MTK 491/591	2	Research Seminar I
	8	Clinical Practicums*

Winter Quarter		(Total Qtr. Hours: 16-18)
CLS 413/513	2	Case Studies 2
CLS 405/505	3	Quality Issues for CLS
	8	Clinical Practicums*
MTK 592	2	Research Seminar 2**
MTK 412/532	1	Professional Development
	2	Elective

Spring Quarter		(Total Qtr. Hours: 13-17)
MTK 404/504	2	Communications
CLS 464/564	3	Comprehensive CLS Review
MTK 593	2	Research Seminar III**
	4-8	Clinical Rotations*
	2	Elective

Master's Degree Students Only

Fall Quarter		
MTK 591	2	Research Seminar I
MTK 594	2	Master's Project I

Winter Quarter		
MTK 592	2	Research Seminar II
MTK 595	2	Master's Project II

Spring Quarter		
MTK 593	2	Research Seminar III
MTK 596	2	Master's Project III

Minimum Hours Required for B.S. Degree = 180
Minimum Hours Required for M.S. Degree = 90

* May substitute Master's Degree Projects
** Master's Degree students only
Note: Courses may not be offered in sequence listed.

Undergraduate Program: 300 and 400 level courses.
Graduate Program: 500 level courses.

Master of Science

The Master of Science in Clinical Laboratory Sciences program is designed for those individuals whose baccalaureate degree is in a field other than Clinical Laboratory Sciences/Medical Technology. Those entering the program achieve entry-level competency in laboratory sciences as well as acquire additional skills in problem solving, management, communication, and research.

Curriculum

The program is built around a core of basic and advanced theoretical knowledge and clinical practice. This combination of both theory and practice enhances the development of skilled, knowledgeable professionals whose flexibility allows them to function at highest level within the various laboratory settings available to graduates of the program. These areas include primary health care facilities, as well as research, educational, and commercial laboratory settings across the country. This rigorous program requires students to achieve a 3.0 GPA on a 4.0 scale in order to graduate. Students will get hands-on experience in laboratory techniques and will develop a thorough knowledge base in clinical laboratory science providing a firm foundation for development and growth after graduation. The mission of the faculty is to do more than train technical healthcare personnel, but to educate clinical laboratory professionals who can meet the current and future demands of laboratory medicine. The Clinical Laboratory Sciences program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), 8410 West Bryn Mawr Avenue, Suite 670, Chicago, Illinois 60631-3415. (773) 714-8880. Graduates are eligible to take the Medical Technology certification examination given by the American Society of Clinical Pathology and the Clinical Laboratory Scientist certification examination given by The National Credentialing Agency for Laboratory Personnel, and upon passing these examinations, they become certified as Medical Technologists, MT(ASCP) and as Clinical Laboratory Scientists, CLS(NCA). Students are not eligible to take the national certification examinations until all degree requirements are met. Verification of degree completion is required from the program director by the American Society of Clinical Pathology Board of Registry.

Admission

The following prerequisites are required for admission:

a. Bachelor of Science degree from an accredited college or university documented with official transcripts from each college or university attended. The following courses are required: Chemistry (including Organic and Quantitative Analysis), Biology (including Microbiology), and Mathematics (Algebra and Statistics)
b. If the Bachelor of Science degree was conferred by a college or university outside of the United States, a detailed report of the transcripts must be evaluated by the Education Credentials Evaluators (ECE)
c. Affiliated students must successfully complete all pre-admission coursework and be recommended by the affiliate's Health Career Advisor
d. An overall GPA of 3.0 on a 4.0 scale
e. Personal interview
f. Three letters of recommendation
g. TOEFL/TSE

Master's Degree in Clinical Laboratory Management

The Master of Science degree in Clinical Laboratory Management joins the academic expertise of two existing programs in the College of Health Sciences and meets a growing market need. It is a joint degree program shared by the Department of Health Systems Management and the Department of Clinical Laboratory Sciences. This program with both full-time and part-time options is designed for the practicing clinical laboratory scientist who desires formal graduate education in management. It builds upon the technical knowledge of the clinical laboratory scientist by providing advanced courses in organizational theory, research, finance, economics and health care organization, as well as clinical laboratory science. Graduates will have enhanced skills and knowledge to develop new approaches to clinical issues, design and implement data analyses, plan and implement new laboratory programs, respond to administrative issues and understand research methods. Graduates will be educated to assume the role of laboratory manager or laboratory supervisor. Blending the technical expertise of a clinical laboratory sciences background with advanced knowledge in the clinical sciences, research, and management, the new program will prepare individuals to effectively meet the challenges and demands of operating a clinical laboratory in today's rapidly evolving health care delivery system. Graduates of the program who have at least two years of full-time acceptable experience in clinical laboratory supervision/management within the last ten years, may apply for the Diplomat in Laboratory Management, DLM (ASCP), certification examination given by the American Society of Clinical Pathology, Board of Registry.

Suggested Course Sequence

Fall		(Total Qtr. Hours: 14)
HSM 502	3	Health Care Organizations
HSM 503	3	Foundation Skills
HSM 531	4	Finance I – Accounting Principles
HSM 582	4	Intermediate Statistics
Winter		(Total Qtr. Hours: 13)
MTK 503	2	Laboratory Management
HSM 515	3	Human Resources Mgmt
HSM 533	4	Health Care Economics
HSM 571	4	Operations Management
Spring		(Total Qtr. Hours: 14)
MTK 505	2	Lab. Info. Systems
HSM 507	4	Epidemiology
HSM 532	3	Finance II – Health Care Managerial Acctg
HSM 543	4	Health Law
HSM 575	1	Ethics
Fall		(Total Qtr. Hours: 12)
CLS 562	3	Marketing and Negotiation
MTK 591	2	Research Seminar I
MTK 594	4	Master's Project I
HSM 545	3	Organizational Analysis
Winter		(Total Qtr. Hours: 12-13)
CLS 563	3	Issues in Pathology
MTK 592	2	Research Seminar II
MTK 595	4	Master's Project II
	3-4	CLS Electives

Spring		(Total Qtr. Hours: 12-13)
CLS 561	3	Regulatory Issues
MTK 596	2	Master's Project III
HSM 577	4	Leadership, Management, and Ethics
	3-4	CLS Electives

Minimum Hours Required for Degree = 77

Admission

The following prerequisites are required for admission:

a. A Bachelor of Science degree from an accredited college or university documented with official transcripts from each college or university attended
b. If a college or university outside the United States conferred the Bachelor of Science degree, Education Credentials Evaluators (ECE) must evaluate a detailed report of the transcripts
c. Certification as a Medical Technologist by the ASCP or as a Clinical Laboratory Scientist by the NCA
d. Acceptable work experience in laboratory sciences
e. A minimum of one course in statistics (or equivalent)
f. A minimum of one course in accounting (must be completed prior to finance sequence)
g. Three letters of recommendation
h. Completion of the GRE or GMAT
i. Personal interview
j. Students from countries where English is not the primary language are required to take the TOEFL as well as the TSE (Test of Spoken English)

Educational Activities

The faculty of the Department of Clinical Laboratory Sciences are responsible for providing both the didactic coursework and the clinical experiences necessary for students to complete successfully all degree requirements. The program is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS), 8410 W. Bryn Mawr Avenue, Suite 670, Chicago, Illinois 60631-3415, (773) 714-8880.

Research Activities

Faculty members of Clinical Laboratory Sciences engage in either technical or educational research. Areas include biochemistry, education, hematology, hospital administration, immunohematology, immunology, molecular oncology and microbiology. The Department of Clinical Laboratory Sciences supports and is involved in the administration of the Continuing Education Program offered to the professional staff of Rush Medical Laboratories.

Service Activities

Faculty members are actively involved in the clinical laboratories of Rush University Medical Center, maintaining active research, supervisory, and clinical positions in their specialty areas. Several faculty members hold conjoint appointments in Rush Medical College and the College of Nursing. They provide the laboratory medicine courses for the medical college curriculum and the graduate nursing college curriculum.

Department of Clinical Nutrition

Philosophy

The primary mission of the Department of Clinical Nutrition is to develop clinical nutrition practitioners who are competent to provide medical nutrition therapy to individuals and groups within a variety of settings and who are prepared at the master's degree level to conduct and to facilitate research which will contribute to the body of knowledge which supports dietetic practice. The program is designed to teach students to integrate and to apply principles of food, nutrition, and management sciences in order to improve the nutritional status of individuals and groups. The importance of maintaining a current knowledge base, critically analyzing research, and incorporating new scientific evidence into practice patterns is emphasized throughout the program.

The philosophy of the department parallels that of the Medical Center in that the academic component is fully integrated with the health care function of the institution. The faculty is committed to excellence in teaching, research, and clinical care and strives to be visionary in meeting the future needs of the profession in a changing health care environment.

The Program

Two programs having a common core of courses and leading to a Master of Science with a major in clinical nutrition are offered.

Pre-Professional. A 21-month dietetic internship/master's degree program that integrates didactic and practicum experience. Upon completion of the program the student is eligible to take the Registration Examination for Dietitians.

Post-Professional. Designed for the Registered Dietitian who wishes to expand his/her understanding of advanced human nutrition and medical nutrition therapies through a critical evaluation, integration and application of nutrition and management research.

Accreditation. The Rush University Medical Center Dietetic Internship is currently granted accreditation status by the Commission on Accreditation of Dietetic Education of The American Dietetic Association. CADE is a specialized accrediting body recognized by the Council on Recognition of Post-Secondary Accreditation and the United States Department of Education. The address and phone number of CADE are 120 S. Riverside Plaza, Suite 2000, Chicago, Illinois 60606, (312) 899-4876.

Admission Requirements

Pre-professional program applicants must provide evidence of having completed a didactic program in dietetics accredited by The American Dietetic Association (ADA) and must participate in the ADA-approved computer matching process. Post-professional program applicants must provide evidence of dietetic registration. All applicants must provide evidence of having successfully completed a college course in basic statistics. Applicants who have obtained their education outside the United States and its territories must have their academic degree(s) validated as equivalent to the baccalaureate or master's degree conferred by a regionally accredited college or university in the United States. These applicants also must submit results of TOEFL examination. The generally applied guideline for acceptance into the program is a B average for undergraduate achievement. Scores on the Graduate Record Examination taken within the last five years must be submitted. Additionally, evidence of work experience in food service systems and/or clinical dietetics is highly recommended.

Academic Progression

The faculty reserves the right to request the withdrawal of any student whose conduct or performance demonstrates lack of fitness for continuance in a health profession. Students in the pre-professional program are required to earn grades of B or better in NTR 505, 506, 511, 512, 513, 514, 515 and 516; grades of C or better are required in all other courses. Failure to earn minimum grades will result in dismissal from the pre-professional program. Automatic probation for any student results when a student's cumulative grade point average (GPA) falls below 3.0 or when a student receives a grade of F in any course. The Committee on Academic Progress and Promotions notifies any student placed on probation, states the reason(s) for probation and the conditions that must be satisfied for removal of probation. A student who earns a grade of D or F in a course, other than those listed above, must repeat the course and earn at least a C. A student who earns a grade of D or F in more than one required course will be dismissed. Full-time students on probation must earn a cumulative GPA of 3.0 or greater by the end of the next two consecutive quarters. Part-time students on probation must earn a cumulative GPA of 3.0 or greater after completing the next 22 quarter hours. Improvement in the GPA must be shown each quarter of probation.

Academic Policies*

The pre-professional program is a combined dietetic internship/master's degree program offered on a full-time basis only. The program extends over seven quarters including a summer session. The post-professional program is a master's degree program for Registered Dietitians offered on a part-time or full-time basis. Both programs may be completed in seven quarters or longer, up to five years. If a student is not finished with the program in five years, a request for extension must be made to the Academic Progress and Promotions Committee. If an extention is granted, conditions of the extension may include additional coursework to assure relevancy and currency of knowledge/competence at the master's level.

Graduation Requirements. A cumulative GPA of 3.0 or greater is required of all graduates. The pre-professional students shall complete a minimum of 73 quarter hours within 36 months from matriculation into the program. Quarter hour credits for research may be extended to a maximum of five years beginning with the first quarter of enrollment in the program. The post-professional students shall complete a minimum of 46 quarter hours within five years from matriculation into the program.

* Additional policies are listed in the College of Health Sciences and in the Academic Information sections.

Research Activities

The faculty of the Department of Clinical Nutrition is involved in basic, clinical and management research. These activities frequently are in collaboration with medical and nursing college faculty members in such departments as neurology, cardiology, oncology, surgery, or obstetrics. A research laboratory is available to support faculty and student research. All students will complete a master's thesis.

Service Activities

Two departments jointly administer the general internship/master's degree program. The Department of Food and Nutrition Services at Rush University Medical Center provides the internship or supervised practice experience. The didactic component of the master of science degree is provided by the Department of Clinical Nutrition in Rush University. The two departments fully integrate operational and academic facilities/staff, providing unique opportunities for the merging of theory and practice within one institution. In addition to the academic program, the Department of Food and Nutrition Services provides nutrition services to the hospital and to the outpatient area, operates four food service units within the Medical Center, and provides leadership in nutrition support in critical care.

Curriculum Schedule by Quarter

Pre-Professional Curriculum

Fall		(Total Qtr. Hours: 11)
NTR 503	2	Management in Dietetics
NTR 511	3	Supervised Experience in Food Systems Management I
NTR 582	3	Introduction to Research
NUR 510	3	Biostatistics I
Winter		(Total Qtr. Hours: 12)
NTR 512	1	Supervised Experience in Food Systems Mgmt II
NTR 521	4	Human Metabolism I
NTR 541	2	Interrelationships in Nutrition and Disease I
NTR 555	3	Nutrition Epidemiology
NTR 565	1	Seminar I
NTR 586A	1	Thesis I
Spring		(Total Qtr. Hours: 12)
NTR 513	2	Supervised Experience in Clinical Nutrition I
NTR 522	4	Human Metabolism II
NTR 542	4	Interrelationships of Nutrition and Disease II
NTR 586B	2	Thesis I
Summer		(Total Qtr. Hours: 11)
NTR 505	2	Advanced Medical Nutrition Therapy I
NTR 514	3	Supervised Experience in Clinical Nutrition II
NTR 543	2	Interrelationships of Nutrition and Disease III
NTR 586C	1	Thesis I
NUR 573	3	Frameworks for Health Promotion
Fall		(Total Qtr. Hours: 11)
HSM 510	2	Health Care in America
NTR 506	3	Advanced Medical Nutrition Therapy II
NTR 515	4	Supervised Experience in Clinical Nutrition III
NTR 587	2	Thesis II
Winter		(Total Qtr. Hours: 11)
NTR 516	6	Supervised Experience in Clinical Nutrition IV
NTR 544	2	Interrelationships of Nutrition and Disease IV
NTR 566	1	Seminar II
	2	Electives
Spring		(Total Qtr. Hours: 5)
NTR 588	3	Thesis III
NTR 595	2	Scientific Rationale for DRI's

Total Quarter Hours for Degree = 73

Post-Professional Curriculum (Part-time Sequencing)

Fall		(Total Qtr. Hours: 2)
HSM 510	2	Health Care in America
Winter		(Total Qtr. Hours: 5)
NTR 521	4	Human Metabolism I
NTR 565	1	Seminar I
Spring		(Total Qtr. Hours: 4)
NTR 522	4	Human Metabolism II
Summer		(Total Qtr. Hours: 3)
	3	Elective
Fall		(Total Qtr. Hours: 6)
NTR 582	3	Introduction to Research
NUR 510	3	Biostatistics I
Winter		(Total Qtr. Hours: 6)
NTR 555	3	Nutrition Epidemiology
NTR 541	2	Interrelationships in Nutrition and Disease I
NTR 586A	1	Thesis I
Spring		(Total Qtr. Hours: 6)
NTR 542	4	Interrelationships of Nutrition and Disease II
NTR 586B	2	Thesis I
Summer		(Total Qtr. Hours: 6)
NTR 543	2	Interrelationships of Nutrition and Disease III
NTR 573	3	Frameworks for Health Promotion
NTR 586C	1	Thesis I
Fall		(Total Qtr. Hours: 2)
NTR 587	2	Thesis II
Winter		(Total Qtr. Hours: 3)
NTR 544	2	Interrelationships of Nutrition and Disease IV
NTR 566	1	Seminar II
Spring		(Total Qtr. Hours: 5)
NTR 588	3	Thesis III
NTR 595	2	Rationale for Dietary Reference Intakes

Minimum Hours Required for Degree = 48

Department of Communication Disorders and Sciences

Philosophy

The underlying basis for the graduate degree programs in speech-language pathology and audiology is the teacher-practitioner model, by which students learn from faculty who take on dual roles as academicians and practitioners. This approach to professional education helps to bridge the gap that can exist between classroom teaching and clinical service delivery. Students learn in an environment where teaching, research, and patient care are fully integrated. The faculty at Rush participate fully in the clinical process in addition to teaching and research. Students receive outstanding clinical education experiences with diverse patients who present a full range of communicative disorders. Department faculty is supplemented by the expertise of physicians, scientists, and other health care professionals within the Medical Center. The audiology and speech-language pathology programs are accredited by the Council on Academic Accreditation of the American Speech-Language-Hearing Association (ASHA).

Doctor of Audiology
Master of Science - Speech-Language Pathology

Admission Requirements

Audiology (Au.D.)
At the time of application, individuals should have completed, or be in the process of completing, the baccalaureate degree at accredited institutions. The baccalaureate degree must be completed before commencing work at Rush University. Students entering the program must have transcript credit for at least one college level math course, at least one course in the behavioral/social sciences, at least one course in the biological sciences, and at least one course in the physical sciences. Although not required, the following coursework is strongly recommended: advanced college-level math (algebra, trigonometry, or calculus), statistics/research methods, child psychology, physics, and computer literacy.

Admission is granted for the fall quarter of each year. The application file includes a completed application with essays, application fee, three letters of recommendation from individuals acquainted with the applicant's academic or professional background, official transcripts from all universities attended, and official scores from the Graduate Record Examination (GRE). Applicants whose native language is not English must submit official scores from the Test of English as a Foreign Language (TOEFL).

The generally applied minimum standards for acceptance into the Au.D. program are a 3.0 undergraduate GPA overall (on a 4.0 scale) or a 3.5 GPA in major courses. Scores on the GRE should be 1000 or higher (verbal plus quantitative). The admissions committee in the department reviews all applications and determines the applicants' eligibility.

Speech-Language Pathology.
At the time of application, individuals should have completed, or be in the process of completing, the baccalaureate degree at accredited institutions. The baccalaureate degree must be completed before commencing work at Rush University. Students entering the program must have successfully completed coursework in introduction to audiology, phonetics and normal articulatory production, normal language development, speech and hearing science, speech and hearing anatomy and physiology, and statistics. In addition, entering students must have transcript credit for at least one course in each of the following areas: biological sciences, physical sciences, social/behavorial, and mathematics.

Admission is granted for the fall quarter of each year. The application file includes a completed application with essays, application fee, three letters of recommendation from individuals acquainted with the applicant's academic or professional background, official transcripts from all universities attended and official scores from the Graduate Record Examination (GRE). Applicants whose native language is not English must submit official scores from the Test of English as a Foreign Language (TOEFL).

The generally applied minimum standards for acceptance into the program are a 3.0 undergraduate grade point average (GPA) overall (on a 4.0 scale) or a 3.5 in major courses in speech-language pathology or a 3.5 in the prerequisite course content as listed in the application. Scores on the GRE should be at the 50th percentile or higher. The admissions committee in the department reviews all applications and determines the applicants' eligibility.

Academic Policies*

Academic Progression. The faculty reserves the right to request the withdrawal of any student whose conduct, health, or performance demonstrates lack of fitness for continuation in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University. Appeal of dismissal must be made in writing to the department chairperson for consideration by the faculty. Only grades of A, B, or C may fulfill degree requirements in all required courses as listed in the curriculum outline. Students will be considered in good standing at Rush University unless placed on academic probation. Due to the nature of the programs, clinical performance and classroom performance will be evaluated separately. Policies related to academic progression will be applied independently to clinical and didactic performance.

Academic probation is assigned to a student who earns a quarterly grade point average (GPA) between 2.0 and 2.99 (on a 4.0 scale) and/or whose cumulative GPA falls below 3.0. For the purpose of determining academic progression, practicum grades are excluded from calculation of the quarterly grade point average. Students placed on probation must earn a quarterly GPA of 3.0 or greater at the end of the next consecutive quarter and demonstrate continuous progress toward achieving a cumulative GPA of 3.0 in each succeeding quarter. A cumulative GPA of 3.0 or greater is required for graduation. A student who earns a quarterly academic GPA of less than 2.0 will be dismissed from the university.

Students placed on probation will be notified in writing by the department chairperson. The letter will state the reasons for placing the student on academic probation and the specific requirements that must be met by the student to reestablish good standing.

A student who earns a grade of less than C in a required course must repeat that course, an equivalent course, or an alternative course at the discretion of the faculty. Petitions regarding the adequacy of a proposed alternative or equivalent course must be submitted to the Academic Affairs Committee of the department, with final approval or denial decided by the faculty. A student who earns a grade of less than C in two or more required courses may be dismissed from the University. In a repeated course, the new grade will replace the earlier grade in the cumulative GPA. Failure to receive a grade of C or better in a repeated course will result in dismissal from the University.

Clinical probation is assigned to a student who fails to achieve a grade of B or higher in a clinical practicum, clerkship, internship, or externship. In such cases, the student is required to re-enroll in the clinical education course. Failure to achieve a grade of B or higher in the repeated course may be considered grounds for dismissal from the University.

Students placed on probation will be notified in writing by the department chairperson. The letter will state the reasons for placing the student on clinical probation and the specific requirements that must be met by the student to reestablish good standing.

Interrupted Program. Any student who wishes or needs to interrupt their program must fulfill the following requirements:

1. Meet with the Department Chairperson and work out a plan of action before leaving the program.
2. Complete all degree requirements within 48 months of the beginning of the first quarter in which the student is enrolled in the department (master's program).
3. Follow all appropriate leave of absence/withdrawal procedures and policies as defined by Rush University.

Transfer of Credit Policy. For the master's degree, a student may transfer up to 12 graduate quarter hours from an ASHA accredited program at the grade of B or better. Up to three of these 12 quarter hours may be in the area of clinical practicum. The issue of transfer credit will be addressed only after the student is accepted into the program. Transfer of credit is also possible for the doctor of audiology degree. Students should check with the Department Chairperson.

Graduation Requirements

The doctor of audiology degree and the master of science degree in speech-language pathology require a cumulative GPA of 3.0 or greater, successful completion of the comprehensive examination, and passing result on the National Examination in Speech-Language Pathology and Audiology. Audiology students also must complete their Investigative Project. All master's degree requirements must be completed within 48 months from the beginning of the first quarter in which a full-time student is enrolled in the program. Students must complete the number of quarter hours required by the program.

Professional Certification

Rush programs in communication disorders and sciences provide the academic background necessary to begin the ASHA clinical fellowship year (speech-language pathology) and for the national certification examinations (audiology and speech-language pathology).

Thesis

The faculty's commitment to research and the belief that an appreciation of scientific matters is valuable to the clinical process provides the basis for the optional master's thesis research. The complete thesis policy is found in the department student manual.

Practicum (Speech-Language Pathology)

Supervised clinical practicum occurs each quarter during the seven-quarter program. A minimum of 37 quarter hours of clinical practicum is required. Enrollment in each quarter of practicum is contingent upon satisfactory completion (grade of B or better) of the previous quarter's practicum. Practicum experiences include patient care activities on-campus and off-campus. Opportunities provide experiences with a full range of speech, language and swallowing disorders. Students are able to express their preferences with regard to practicum sites outside the Medical Center.

* Additional policies are listed in the College of Health Sciences and in the Academic Information sections, as well as in the department's student and practicum manuals.

Audiology - Doctor of Audiology

Fall		(Total Qtr. Hours: 14)
CDS 507	3	Neurological Bases of Speech and Hearing
CDS 509	1	Clinical Observation in Audiology
CDS 535	4	Anatomy and Physiology of Hearing and Speech
CDS 536	1	Auditory System Anatomy Lab
CDS 603	4	Acoustics and Psychoacoustics
CDS 591	1	Applied Topics in CDS I
Winter		(Total Qtr. Hours: 14)
CDS 516	1	Audiology Practicum I
CDS 528	4	Audiologic Assessment
CDS 529	1	Clinical Methods in Audiology
CDS 531	3	Amplification I
CDS 554	2	Instrumentation in Audiology
CDS 571	3	Speech and Language Development and Disorders
Spring		(Total Qtr. Hours: 15)
CDS 517	2	Audiology Practicum II
CDS 604	2	Acoustic Phonetics and Speech Perception
CDS 605	3	Embryology and Genetics of Auditory System
CDS 543	4	Electrophysiologic Assessment of the Auditory System
CDS 533	4	Rehabilitative Audiology

Summer		(Total Qtr. Hours: 14)
CDS 518	3	Audiology Practicum III
CDS 523	2	Sign Language
CDS 544	3	Pediatric Audiology
CDS 566	3	Pathophysiology of the Auditory System
CDS 610	3	Professional Issues in Audiology
Fall		(Total Qtr. Hours: 14)
CDS 519	3	Audiology Practicum IV
CDS 546	4	Vestibular Assessment and Rehabilitation
CDS 547	1	Vestibular Lab
CDS 608	2	Pharmacology
NUR 510	3	Biostatistics
CDS 592	1	Applied Topics in CDS II
Winter		(Total Qtr. Hours: 13)
CDS 520	3	Audiology Practicum V
CDS 548	4	Advanced Electrophysiologic Assessment
CDS 575	3	Issues in Counseling
CDS 581	3	Research Methods
Spring		(Total Qtr. Hours: 14)
CDS 532	5	Amplification II
CDS 616	4	Clerkship I
CDS 636	3	Educational Audiology
CDS 633	2	Geriatric Audiology
Summer		(Total Qtr. Hours: 11)
CDS 534	2	Pediatric Rehabilitative Audiology
CDS 631	2	Auditory Processing
CDS 617	4	Clerkship II
CDS 635	2	Cochlear Implants
CDS 660	1	Leadership Seminar
Fall		(Total Qtr. Hours: 15)
CDS 612	2	Practice Management
CDS 618	4	Clerkship III
CDS 626	3	Hearing Conservation
CDS 661	1	Seminar in Amplification
HSM 510	2	Health Care in America
CDS 659	2	Seminar in Ethics
CDS 592	1	Applied Topics in CDS II
Winter		(Total Qtr. Hours: 8)
CDS 619	5	Internship I
CDS 681	3	Investigative Project
Spring		(Total Qtr. Hours: 8)
CDS 620	5	Internship II
CDS 681	3	Investigative Project
Summer		(Total Qtr. Hours: 8)
CDS 691	8	Externship I
Fall		(Total Qtr. Hours: 8)
CDS 692	8	Externship II
Winter		(Total Qtr. Hours: 8)
CDS 693	8	Externship III
Spring		(Total Qtr. Hours: 8)
CDS 694	8	Externship IV

Minimum Hours Required for Au.D. Degree: 172

Speech-Language Pathology - Master of Science

Fall		(Total Qtr. Hours: 14)
CDS 501	1	Audiological Methods for Speech-Lang Pathologists
CDS 504	4	Speech Science
CDS 507	3	Neurological Bases of Speech and Hearing
CDS 537	3	Anatomy and Physiology of the Speech System
CDS 538	1	Speech System Anatomy Lab.
CDS 511	1	Speech-Language Practicum I
CDS 591	1	Applied Topics in CDS I
Winter		(Total Qtr. Hours: 17)
CDS 558	3	Dysphagia
CDS 560	4	Seminar in Phonological Disorders
CDS 564	4	Aphasia
CDS 581	3	Research Methods in Communication Disorders
CDS 512	3	Speech-Language Practicum II
Spring		(Total Qtr. Hours: 16)
CDS 521	3	Language Disorders in Preschool Children
CDS 533	4	Adult Rehabilitative Audiology
CDS 540	3	Mgt. Head/Neck Canc. Patient: SLP Eval/Interven
CDS 563	3	Voice Disorders
CDS 513	3	Speech-Language Practicum III
Summer		(Total Qtr. Hours: 13)
NSG 331	3	Pathology I
CDS 562	3	Craniofacial Anomalies
CDS 567	4	Dysarthria
CDS 514	3	Speech-Language Practicum IV
Fall		(Total Qtr. Hours: 15)
HSM 510	2	Health Care in America
CDS 510A	3	Prof. Issues in Comm. Disorders
CDS 522A	3	Language Disorders in School Age Children
CDS 568A	3	Cognition and Communication Disorders
CDS 515	3	Speech-Language Practicum V
CDS 592	1	Applied Topics in CDS II
Winter		(Total Qtr. Hours: 15)
CDS 524	3	Fluency, Dysfluency, and Stuttering
CDS 575	3	Issues in Counseling
CDS 590	9	External Practicum
Spring		(Total Qtr. Hours: 15)
CDS 590	15	External Practicum

Minimum Hours Required for M.S. Degree: 105

Educational Activities

The Department of Communication Disorders and Sciences provides professional training in speech-language pathology and audiology. Its programs are unique in that the education of speech-language pathologists and audiologists are based on the facilities and opportunities offered by an academic health center. In addition to didactic and clinical activities, students and faculty participate in journal clubs, rounds, and student/faculty development. Faculty members are involved in educational programs of residents and students in the college of medicine. Faculty participate in grand rounds for various medical specialties and provide in-service programs for staff at Rush University Medical Center and at the Johnston R. Bowman Center for the Elderly.

Research Activities

Faculty are involved in independent and collaborative research in the areas of audiology, hearing science, and speech-language pathology. Faculty members publish in professional journals and present at national and state meetings. Summaries of faculty research and professional activities are available on-line. Students are encouraged to participate in the research process, including development of hypotheses, data collection, and presentation or publication of results.

Service Activities

The faculty provide a full range of diagnostic and therapeutic services to a large clinical population, both inpatients and outpatients. In addition, faculty actively participate in professional affairs on the local and national level. Students and faculty participate in health fairs and screenings throughout the year.

Department of Health Systems Management

Philosophy

The Health Systems Management program, which started in 1978, trains students for highly successful careers in the rapidly growing field of health care management. Graduates become hospital administrators, health care consultants, manage physicians' practices and work in international health care development and in professional associations. The hallmarks of the program are its practitioner-teacher model and outstanding faculty-student ratio, which provide many opportunities for mentoring and professional growth. The program, which is highly ranked by the U.S. News and World Report and is accredited by the Association of University Programs in Health Administration, links practitioner-focused coursework with real-world management experience. Students study a comprehensive health management curriculum taught by experienced educators who are also top medical administrators.

Admissions Requirements

Applicants must have a bachelor's degree from an accredited college or university and have taken an undergraduate course in accounting and an undergraduate course in statistics. The prerequisite courses do not have to be completed before applying for admission, but they must be completed prior to enrollment. Applicants fill out an application (available online or downloadable from the HSM web site), provide three letters of recommendation and submit their academic transcripts. In addition, they are to submit scores from either the Graduate Record Examination (GRE) or the Graduate Management Aptitude Test (GMAT). International students must submit a credentialing evaluation of their international education as well as the results from the Test of English as a Foreign Language (TOEFL).

Curriculum

The curriculum is designed to instruct students in the current theory and practice of health services management, including the study of organizational behavior, quantitative and analytical techniques, planning, finance and human resources management. The structure of the curriculum gives students the opportunity to apply managerial principles in real world learning environments and to design and conduct applied research projects. The curriculum content focuses on:

- Management and administrative skills and their application to health services organizations through a study of organizational behavior, quantitative methods, budgeting, finance, information systems, law, strategic planning, governance, health policy, marketing and managed care.
- Health services administration through a study of health economics and social and environmetal determinants of health and disease.

Course Offerings by Quarter (Full-time Program)

Fall		(Total Qtr. Hours: 13-14)
HSM 501	1	Professional Skills Development
HSM 502	4	Health Care Organizations
HSM 531	4	Finance I: Accounting Principles
HSM 582	4	Intermediate Statistics
HSM 590	0-1	Topics in Health Systems Management or Elective
Winter		(Total Qtr. Hours: 14)
HSM 507	3	Epidemiology
HSM 532	3	Finance II: Health Care Managerial Accounting
HSM 533	4	Health Care Economics
HSM 551	3	Information Systems I
HSM 576	1	Ethics in Health Care Management
Spring		(Total Qtr. Hours: 13-14)
HSM 515	3	Human Resources Management
HSM 543	4	Health Law
HSM 552	3	Information Systems II
HSM 557	3	Quality in Health Care
HSM 590	0-1	Topics in Health Systems Management or Elective
Fall		(Total Qtr. Hours: 13-15)
HSM 559	3	Health Care Marketing and Communications
HSM 560	3	Health Care Policy
HSM 571	3	Operations Management
HSM 590	0-2	Topics in Health Systems Management or Elective
HSM 597	4	Master's Project
Winter		(Total Qtr. Hours: 12-14)
HSM 536	4	Corporate Finance
HSM 545	3	Organizational Analysis
HSM 556	1	Health Care Information Management Seminar
HSM 590	0-2	Topics in Health Systems Management or Elective
HSM 597	4	Master's Project
Spring		(Total Qtr. Hours: 12)
HSM 539	2	Finance Seminar
HSM 547	4	Strategic Analysis in Health Care
HSM 567	3	Managed Care
HSM 579	3	Governance and Leadership in Health Care

Minimum Hours Required for Degree = 80

Course Offerings by Quarter (Part-time Program)

Summer		(Total Qtr. Hours: 2)
HSM 501	1	Professional Skills Development
HSM 576	1	Ethics in Health Care Management
Fall		(Total Qtr. Hours: 8-9)
HSM 502	4	Health Care Organizations
HSM 582	4	Intermediate Statistics
HSM 590	0-1	Topics in Health Systems Management or Elective
Winter		(Total Qtr. Hours: 7-8)
HSM 533	4	Health Care Economics
HSM 551	3	Information Systems I
HSM 590	0-1	Topics in Health Systems Management or Elective
Spring		(Total Qtr. Hours: 7-8)
HSM 507	3	Epidemiology
HSM 531	4	Finance I: Accounting Principles
HSM 590	0-1	Topics in Health Systems Management or Elective
Summer		(Total Qtr. Hours: 7-8)
HSM 532	3	Finance II: Health Care Managerial Accounting
HSM 543	4	Health Law
HSM 590	0-1	Topics in Health Systems Management or Elective
Fall		(Total Qtr. Hours: 6-7)
HSM 515	3	Human Resources Management
HSM 559	3	Health Care Marketing and Communications
HSM 590	0-1	Topics in Health Systems Management or Elective
Winter		(Total Qtr. Hours: 6-7)
HSM 545	3	Organizational Analysis
HSM 579	3	Governance and Leadership in Health Care
HSM 590	0-1	Topics in Health Systems Management or Elective
Spring		(Total Qtr. Hours: 6-7)
HSM 552	3	Information Systems II
HSM 571	3	Operations Management
HSM 590	0-1	Topics in Health Systems Management or Elective
Summer		(Total Qtr. Hours: 8)
HSM 556	1	Health Care Information Management Seminar
HSM 557	3	Quality in Health Care
HSM 597	4	Master's Project
Fall		(Total Qtr. Hours: 7-8)
HSM 560	3	Health Care Policy
HSM 590	0-1	Topics in Health Systems Management or Elective
HSM 597	4	Master's Project
Winter		(Total Qtr. Hours: 7-8)
HSM 536	4	Corporate Finance
HSM 567	3	Managed Care
HSM 590	0-1	Topics in Health Systems Management or Elective
Spring		(Total Qtr. Hours: 6-7)
HSM 539	2	Finance Seminar
HSM 547	4	Strategic Analysis in Health Care
HSM 590	0-1	Topics in Health Systems Management or Elective

Minimum Hours Required for Degree = 80

Academic Policies*

Enrollment. The curriculum can be taken full-time or part-time. Full-time students attend the program during the day for six quarters taken over two academic years, with a summer break. Part-time students typically attend classes year round in the evenings and weekends. The program must be completed within a five-year time limit unless the student is granted a waiver by program officials.

Academic Progression. All students in the Department of Health Systems Management must achieve a grade point average of 3.0 (A = 4.0) each quarter to maintain satisfactory academic status. A student is placed on academic probation when his or her grades fall below a quarterly or cumulative GPA average of 3.0 or when a student receives a grade of F in any course. Students may be placed on academic probation when their academic deficiencies are deemed to be significant by the Committee on Academic Progress and Promotions. A student on academic probation shall remain so until he/she has remedied all deficiencies and met all requirements established by the committee for removal from academic probation.

*Additional policies are listed in the College of Health Sciences and the Academic Information sections.

Student Jobs

Full-time students have the opportunity for on-the-job training through part-time jobs throughout Rush University Medical Center and its affiliates. The jobs provide practical experience, reinforce the coursework and offer students a multi-faceted perspective on the field of health care management. Students receive assistance in finding these opportunities during the school year and during the summer break.

Graduation Requirements

To be eligible to graduate, a student must successfully complete all the HSM academic requirements, which includes earning a minimum of 80 quarter hours of credit and achieving a minimum cumulative grade point average of 3.0. Prior to graduation, the

Committee on Academic Progress and Promotions determines if the students have met the program requirements; the Committee then makes a recommendation to the entire department faculty, which gives final approval for the awarding of degrees.

Research Activities

Research is an integral part of the Department of Health Systems Management, and HSM faculty and students are actively involved in a variety of applied research projects. Recent faculty projects include: "Succession Planning Practices and Outcomes in U.S. Hospitals: A Multilevel Analysis of Survey-Based Data," "360-Degree Feedback for Leadership Development in Health Administration," "What Determines Patient Satisfaction with Pain Management?" "The Impact of Demographic and Labor Force Participation Changes on the Social Security Disability Insurance and Medicare Programs," "Evaluation of Rehabilitation for Work-Related Low Back Disorders in Service Parts Operations," "Increasing the Breast Cancer Screening Rate in High-Risk Medically Underserved Women," "JCAHO Patient Safety Goals: Compliance with Use of Abbreviations, Acronyms and Symbols," and "Organizational and Culture Change for Providing Safe Care."

Recently completed student master's projects include: "Changes in Nurse Satisfaction after Conducting Educational Interventions to Improve M.D.-R.N. Collaboration," "The Effectiveness of a Multifaceted Intervention to Improve Physician Laboratory Ordering Patterns in the Diagnosis of Acute Pancreatitis," "A Study of the Effect of Educational and Administrative Interventions on Physician Behavior: Reducing Demerol Use," "Predictors of Smoking Cessation in an Urban Hospital," and "The Effect of Waiting Time on Overall Patient Satisfaction in the ER."

Faculty Work/Service Activities

Members of the faculty of the Department of Health Systems Management are actively involved in the operation of the Medical Center as hospital administrators and health care planners, university administrators, financial managers, clinicians, attorneys, researchers, and information services managers. They serve as consultants to hospitals, planning bodies, and other organizations.

Faculty members regularly hold leadership positions, participate in seminars and engage in other professional activities sponsored by the American College of Healthcare Executives, the American Hospital Association, the Chicago Health Executives Forum, the Healthcare Financial Management Association, the Association of University Programs in Health Administration, the Healthcare Information Management Systems Society and the Illinois Hospital and Health Systems Association.

Department of Medical Physics

Philosophy

The Department of Medical Physics offers a program of study and research leading to the master of science degree. The faculty members of the division are active in theoretical and experimental research in medical physics and its clinical applications. The faculty's diverse interests allows the department to offer a program that can satisfy students' interests and needs in several areas of medical physics:

Dosimetry
Imaging applied to medicine
Radiation sources
Physics of radiation oncology
Physics of diagnostic radiology
Physics of nuclear medicine
Radiation protection

Career Opportunities

Medical physics applies the concepts, methods and forces of physics to the diagnosis and treatment of human disease. Medical physicists work at the forefront of medical science, often in hospitals with or without associated academic programs. They provide clinical physics services, carry out research, give direct assistance to their medical colleagues and help train future medical physicists, resident physicians, medical students and medical technologists.

The Program

The master of science with a major in medical physics program is offered through the Department of Medical Physics. In order to produce well-rounded, highly competent medical physicists, the curriculum provides training in the physics of radiation therapy, diagnostic radiology, nuclear medicine, radiation protection and radiobiology, as well as in such subjects as anatomy, physiology and computer science. The counterpart Division of Medical Physics in The Graduate College offers a master of science degree with a major in radiological sciences, as well as a doctor of philosophy with medical physics as the area of interest.

Admission

The successful applicant must meet the following requirements:

1. Hold a bachelor of science degree with a major in physics, or a bachelor of science or engineering degree with a minor in physics, from an accredited college or university.
2. Complete one year of college chemistry, including a laboratory component. This requirement may be satisfied within the master of science program at Rush.
3. Earn a cumulative grade point average (GPA) of 3.0 (A = 4.0) in college work.
4. Earn a cumulative GPA of at least 3.0 in all science courses completed at college.
5. Submit Graduate Record Examination (GRE) results achieved within the last three years. It is recommended that results from the physics subject examination also be submitted.
6. Submit Test of English as a Foreign Language (TOEFL) results if the applicant is an international student.
7. Supply three letters of recommendation from previous college or university instructors.
8. Provide evidence of prior success in pursuing independent study.
9. Write a description of his or her scientific research interests.

Currently, space in the Medical Physics program is very limited. Applicants should contact the Department before submitting an application for admission.

Master of Science

Fall		(Total Qtr. Hours: 12)
MPH 457	2	Radiation Safety of Radioactive Materials
MPH 461	3	Diagnostic Radiation Physics
MPH 565	2	Transfer Function Analysis
MPH 501	4	Radiation Physics
MPH 590	1	Seminar
Winter		(Total Qtr. Hours: 12)
MPH 502	4	Radiological Physics I
MPH 505	2	Radiation Physics Lab
MPH 590	1	Seminar
	5	Elective
Spring		(Total Qtr. Hours: 13)
MPH 471	3	Physics of Nuclear Medicine I
MPH 503	4	Radiological Physics II
MPH 531	3	Radiation Biology
MPH 590	1	Seminar
	2	Elective
Summer		(Total Qtr. Hours: 12)
ANA 592	4	Anatomy
MPH 506	3	Clinical Physics Practicum
MPH 590	1	Seminar
	4	Elective
Fall		(Total Qtr. Hours: 12)
MPH 463	2	MRI Imaging
MPH 506	4	Clinical Physics Practicum
MPH 590	1	Seminar
	3	Physiology
	2	Elective
Winter		(Total Qtr. Hours: 12)
MPH 565	3	Digital Imaging
MPH 506	4	Clinical Physics Practicum
MPH 590	1	Seminar

MPH 598	2	Research
	2	Elective

Spring		(Total Qtr. Hours: 12)
MPH 505	5	Radiological Physics Laboratory
MPH 590	1	Seminar
MPH 598	6	Research

Minimum Hours Required for Degree = 80

Academic Policies*

Grading. All medical physics courses will be graded using letter grades except MPH 505, 506, 590, 597 and 598, which are graded pass/no pass.

Academic Progression. The faculty reserves the right to request the withdrawal of any student whose conduct, health or performance is unsuitable for a health profession. Any such student not voluntarily withdrawing will be dismissed from the University. Only grades of A, B, and C in required courses may fulfill degree requirements. Students will be considered in good standing at Rush University unless placed on academic probation. Academic probation is assigned to a student who earns a quarterly GPA between 2.0 or 2.99 inclusive or whose cumulative grade point average falls below 3.0. Full-time students placed on probation must earn a cumulative GPA of 3.0 or greater at the end of the next consecutive quarter. Part-time students placed on probation must earn a cumulative GPA of 3.0 or greater by the end of the next two consecutive quarters. A student who earns a quarterly grade point average below 2.0 will be dismissed from the University. A student who earns a grade of D or F in a required course must repeat the course. Failure to earn a grade of C or better in a repeated course will result in dismissal from the University. In a repeated course, the new grade will replace the earlier D or F grade in the cumulative GPA. A student who earns a grade of D or F in two or more required courses will also be dismissed from the University. Students placed on academic probation will be notified by letter from the department chairperson following a meeting of the Student Progress Review Committee. The letter will explain why the student was put on academic probation and the specific requirements the student must meet to re-establish good standing.

Full-time and Part-time Enrollment. Although the faculty recommends full-time enrollment to maximize the opportunities available to students, part-time enrollment for all, or part, of the program may be arranged.

Graduation Requirements. The program requires a cumulative grade point average of 3.0 or greater to graduate. All degree requirements must be completed within five calendar years from the beginning of the first quarter in which the student is enrolled in the program. The minimum number of quarter hours required for graduation is 80. This requirement is fulfilled by registration in required courses plus elective courses. The required courses are: MPH 457, 461, 471, 501, 502, 503, 505, 506 (A, B and C), 531, 565, 590, 598; one course in anatomy (ANA 592); one course in physiology and one course in electronic circuits. Each student must develop and carry out a research project that culminates in writing a thesis. At the end of the first year, the student must take and pass a qualifying examination based on selected basic principles of physics, therapeutic and imaging physics, radiation protection, transfer function analysis and current topics in medical physics. The examination will include both written and oral components. Passing this examination qualifies the student to continue work toward the master's degree. A final examination in defense of the thesis will be given at the completion of thesis research. If a student fails to pass the final examination, the faculty will determine whether the student will be granted a second and last opportunity. Upon such recommendation, a second examination may be scheduled within nine months of the initial examination.

* Additional policies are listed in the College of Health Sciences and the Academic Information sections.

Professional Certification

This program provides the basis for certification as a radiological physicist by the American Board of Radiology and the American Board of Medical Physics.

Educational Activities

In addition to providing educational and research experiences for students in the master's program, the medical physics faculty members, most of whom hold joint faculty appointments in Rush Medical College, teach medical students and other students and residents.

Service Activities

Most faculty members are practitioner-teachers who provide patient care services through Rush University Medical Center. Several faculty members also serve as medical physics consultants to a network of hospitals and health care centers in the Chicago metropolitan area.

Research Activities

Faculty members are active in theoretical and experimental research in medical physics and its clinical applications. This research includes the study of basic mechanisms by which radiation transfers energy to the medium; the development of new techniques for directing and measuring various radiations used in the detection, diagnosis and treatment of cancer; the optimization of physical parameters for diagnostic medical imaging including radiography, computerized tomography and radionuclide imaging; optimization of treatment plans for radiation treatment of cancer; three-dimensional graphics display in diagnostic imaging and radiation oncology; and biological radiation dosimetry.

Department of Occupational Therapy

The Department of Occupational Therapy offers a graduate program that prepares the student for unique contributions to the field of occupational therapy. This professional level program is designed for individuals with baccalaureate degrees in other fields who are seeking to become occupational therapists at the graduate level.

Philosophy

The faculty of the graduate program in occupational therapy emphasizes an educational approach, which integrates occupational therapy and didactic material with clinical application and practice. The purpose of this educational philosophy is to allow the student maximum opportunity for the highest levels of integration of content and understanding of rationale for instruction. This philosophy is fostered through such concurrent sequencing of theory and clinically based experience that the student is able to relate to either or both environments depending upon which best facilitates the learning process. The early and continuous collaboration between the theoretical and the clinical learning environments allows for the development of a collegiality between faculty and students. Through such relationships, the student's personal growth and opportunities for independent thinking are fostered. Concern for the student as an individual, mirrored in the relationship with faculty, provides the student with a variety of individualized learning options and experiences within diversified work environments.

Professional Description

Educational Orientation. The professional graduate program at Rush University is designed for the student who has acquired a variety of life experiences through previous educational, vocational, and avocational activities. The program values the incorporation of these life experiences into the educational activities of the program. The educational philosophy utilized in the program that best addresses these spheres is based on theories of adult learning. By basing the program on adult learning theories, it is possible to build on the students' past, connect it to their activities of the present, and predict a future of competent, capable responses to the needs of the profession. The program is designed to enable the student to learn not only the content and theories of occupational therapy, but also the process of utilizing the multiple resources of the learning environment, including teachers and peers. A series of carefully designed learning experiences, occurring within and outside the classroom, promote independence in conjunction with collegial interaction, problem solving and clinical reasoning, and analysis and synthesis of information. The graduate emerges as a competent therapist who has maintained initial curiosity and has added to it through increased ability for creative thinking. Because of experiences in self-directed learning and in self-identification of needs, the graduate is able to be responsible and responsive to the needs of the profession. The graduate is expected to be a life-long learner who is capable of maintaining professional integrity when faced with challenges and complexities of contemporary healthcare.

Professional Orientation. Since the Rush graduate will be prepared to work in a variety of traditional and nontraditional settings, their practice base is the result of broad experiences within the many arenas of occupational therapy. The graduates have the ability to add increasing amounts of depth and validation to their treatment programs as a result of their involvement and experiences with problem solving approaches to therapy. Given the combination of breadth and depth of knowledge and experience related to occupational therapy treatment, the primary strength of Rush University graduates will be their ability to function as highly resourceful clinicians. As in the past, and for the foreseeable future, the role of the clinician is the core of all occupational therapy. The practitioner who is able to base treatment on established fact, use internal and external resources, and engage in clinical reasoning and problem solving is the practitioner who will contribute to the credibility and viability of the profession. It is this type of practitioner who is expected to be the product of the Rush program. The graduates of the program are able to enter the clinical arena competently and confidently, applying their clinical skills and expanding upon those skills as individual situations require. This continuous process of assessment and expansion contributes to the personal and professional growth vital to occupational therapist. The role of the clinician, as it is understood in this context, incorporates other major roles of the therapist. As the Rush program is designed, the students have the opportunity to explore the functions of the therapist as an educator, researcher and manager from the practitioner's perspective. The involvement of the student in these other roles is another major strength of the program. The additional roles of educator, manager, and researcher cannot be separated from the practitioner's role.

Admission Requirements

The applicant to the professional program in occupational therapy must have completed or must show evidence of the following in order to be considered for admission:

- A completed application accompanied by the $40 non-refundable application fee.
- A baccalaureate degree from an accredited college or university. Recommended minimum grade point average of a 3.0 on a 4.0 scale.
- Official scores from Graduate Record Examination (GRE) or Miller Analogies Test (MAT) taken within the past five years,
- Prerequisite courses including statistics, sociology or anthropology, human growth and development (must cover the entire lifespan), two psychology courses in addition to human growth and development, and human anatomy (with lab, preferably cadaver) and human physiology (with lab). Human anatomy and human physiology must be taken within five years prior to admission to program. Two sequential courses with labs will also satisfy this prerequisite.
- Three letters of recommendation. One recommendation must be from an occupational therapy practitioner.
- Official transcripts from every college or university attended by the applicant.
- Experience/familiarity with occupational therapy either through observation, volunteering, or work experience with an OT practitioner.

- An essay on familiarity with occupational therapy through experience and how this experience has confirmed the choice of occupational therapy as a career.

The Admissions Committee will make decisions regarding the acceptability of the applicant to the program. All application materials will be evaluated. Academic and non-academic factors, including extra-curricular activities, job and life experiences will be taken into consideration. Selected applicants will be required to participate in an on-site visit which will include a faculty interview and writing sample. Recognizing the need of occupational therapists to serve a population representative of diverse social, ethnic, cultural, and economic backgrounds, a goal of the Admissions Committee will be to select a class likely to meet these diverse needs.

Application Deadlines

The priority application is October 15th for the following summer quarter. However, applications will continue to be accepted provided space is available. Enrollment is limited to 25 students. Applicants are therefore encouraged to apply as early as possible. Completed applications will be reviewed beginning October 15th and applicants will be selected to interview. If selected, applicants who wish to continue in the application process must complete an on-site interview. Interviews will be scheduled from December onward with applicants accepted through early June.

Academic Progression

The faculty reserves the right to request the withdrawal of any student whose conduct, health, or performance demonstrates lack of fitness for continuance in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University. Only grades of A, B, or C may fulfill degree requirements in all required courses. Students will be considered in good standing at Rush University unless placed on academic probation. Academic probation is assigned to a student who earns a quarterly GPA between 2.0 and 2.99, inclusive. Full-time students placed on probation must earn a cumulative grade point average of 3.0 or greater at the end of the next consecutive quarter. Part-time students placed on probation must earn a cumulative GPA of 3.0 or greater by the end of the next two consecutive quarters.

Students placed on academic probation for the first time must meet with their advisor and establish an action plan prior to the beginning of the next quarter. If a student is placed on probation a second time, he or she must petition the Student Performance and Academic Review Committee (SPARC) and provide an action plan that is acceptable to SPARC in order to continue in the program. The student will also be responsible to meet with his or her advisor to determine the best means of carrying out the aforementioned action plan. If eligible for academic probation for a third time, a student will be dismissed from the program. A student receiving a D or F in a required course must repeat the course and earn at least a C to remain in the program. Only one D or F is allowed per academic year, and no more that two are allowed in the entire program. The departmental Performance and Academic Review Committee must approve any deviation from these policies.

Academic Policies**

Full-time and Part-time Enrollment. The full-time academic program is a 27-month program covering nine academic quarters. Instruction is provided by occupational therapy faculty and faculty members from other departments and colleges within the University. Completion of all courses may take up to 51 months, on a part-time basis, but the final 12 months must be conducted on a full-time basis. To be considered part-time, a student must be enrolled for a minimum of three credits and fewer than 12 credits per quarter. A minimum of 117 credits is required for graduation.

Accreditation and Certification. The Occupational Therapy program is accredited by the Accreditation Council for Occupational Therapy Education of the American Occupational Therapy Association*. Graduates will be eligible to sit for the national certification examination for the occupational therapist administered by the National Board for Certification in Occupational Therapy, Inc. (NBCOT)**.

After successful completion of this exam, the individual will be an Occupational Therapist, Registered (OTR). In Illinois, occupational therapists must be licensed in order to practice and state licensure is based on the results of the NBCOT certification examination. This is true in many other states but specific requirements for licensure may be determined by contacting individual state licensing boards.

Additional information can be obtained by contacting:

*Accreditation Department, American Occupational Therapy Association, 4720 Montgomery Lane, P.O. Box 31220, Bethesda, MD 20824-1220. Phone: (301) 652-2682

**NBCOT, 800 South Frederick Avenue, Suite 200, Gaithersburg, MD 20877-4150. Phone: (301) 990-7979

Graduation Requirements. The Master of Science with a major in occupational therapy requires a cumulative grade point average of 3.0 or greater to graduate. All degree requirements must be completed within 36 months for full-time students and 51 months for part-time students from matriculation into the program. A minimum of 117 quarter hours is required for graduation.

**Additional policies are listed in the College of Health Sciences and in the Academic Information sections.

Full-time Curriculum

Summer		(Total Qtr. Hours: 12)
OCC 500	2	Orientation/Computer Application
OCC 502	3	OT History and Philosophy
OCC 504	4	Human Structure and Principles of Movement
OCC 506	3	Medical Conditions Seminar
Fall		(Total Qtr. Hours: 12)
HSM 510	2	Health Care in America
OCC 503	3	Occupation, Health and Development
OCC 523	3	Psychosocial Dysfunction
HCE 581	4	Introduction to Research
Winter		(Total Qtr. Hours: 14)
OCC 505	3	Group Dynamics
OCC 551	3	OT Perspectives in Ethics and Multiculturalism
OCC 561	4	Analysis of Occupational Performance
OCC 582	4	Research II*
Spring		(Total Qtr. Hours: 15)
OCC 511	5	OT Interventions I
OCC 516	1	OT Interventions I - Fieldwork
OCC 525	4	Introduction to Neuroscience
OCC 531	2	Principles and Methods of Education
OCC 542	3	Evaluation and Assessments
OCC 583	0	Research III**
Summer		(Total Qtr. Hours: 15)
OCC 512	5	OT Interventions II
OCC 517	1	OT Interventions II - Fieldwork
OCC 536	4	Issues and Perspectives in Pediatric OT
OCC 543	3	Health Care Organizations
OCC 573	2	OT Perspectives in Technology
OCC 583	0	Research III**
Fall		(Total Qtr. Hours: 13)
OCC 513	5	OT Interventions III
OCC 514	4	OT Interventions IV
OCC 518	1	OT Interventions III - Fieldwork
OCC 537	3	Issues and Perspectives in Geriatric OT
OCC 583	0	Research III**
Winter		(Total Qtr. Hours: 12)
OCC 595	12	Advanced Fieldwork I
Spring		(Total Qtr. Hours: 12)
OCC 596	12	Advanced Fieldwork II
Summer		(Total Qtr. Hours: 12)
OCC 544	2	Management Concepts for OT
OCC 583	6	Research III*
OCC 590	4	Advanced Practice Seminar

*Thesis option available. Includes courses OCC598A, OCC598B, and OCC598C in place of OCC 582 and OCC 583.

**OCC 583 Research III is a continuous course beginning in quarter 4 with grade and credit given upon completion in quarter 9.

Minimum Hours Required for Degree = 117

Part-time Curriculum

Summer		(Total Qtr. Hours: 8)
OCC 500	2	Orientation/Computer Application
OCC 502	3	OT History and Philosophy
OCC 506	3	Medical Conditions Seminar
Fall		(Total Qtr. Hours: 5)
HSM 510	2	Health Care in America
OCC 503	3	Occupation, Health and Development
Winter		(Total Qtr. Hours: 7)
OCC 551	3	OT Perspectives in Ethics and Multiculturalism
OCC 561	4	Analysis of Occupational Performance
Spring		(Total Qtr. Hours: 7)
OCC 525	4	Introduction to Neuroscience
OCC 542	3	Evaluation and Assessments
Summer		(Total Qtr. Hours: 9)
OCC 504	4	Human Structure and Principles of Movement
OCC 543	3	Health Care Organizations
OCC 573	2	OT Perspectives in Technology
Fall		(Total Qtr. Hours: 7)
OCC 523	3	Psychosocial Dysfunction
HCE 581	4	Introduction to Research
Winter		(Total Qtr. Hours: 7)
OCC 505	3	Group Dynamics
OCC 582	4	Research II*
Spring		(Total Qtr. Hours: 8)
OCC 511	5	OT Interventions I
OCC 516	1	OT Interventions I - Fieldwork
OCC 531	2	Principles and Methods of Education
OCC 583	0	Research III**
Summer		(Total Qtr. Hours: 10)
OCC 536	4	Issues and Perspectives in Pediatric OT
OCC 512	5	OT Interventions II
OCC 517	1	OT Interventions II - Fieldwork
OCC 583	0	Research III**
Fall		(Total Qtr. Hours: 13)
OCC 513	5	OT Interventions III
OCC 514	4	OT Interventions IV
OCC 518	1	OT Interventions III - Fieldwork
OCC 537	3	Issues and Perspectives in Geriatric OT
OCC 583	0	Research III**
Winter		(Total Qtr. Hours: 12)
OCC 595	12	Advanced Fieldwork I
Spring		(Total Qtr. Hours: 12)
OCC 596	12	Advanced Fieldwork II
Summer		(Total Qtr. Hours: 12)
OCC 544	2	Management Concepts for OT
OCC 583	6	Research III*
OCC 590	4	Advanced Practice Seminar

*Thesis option available. Includes courses OCC598A, OCC598B, and OCC598C in place of OCC 582 and OCC 583.

**OCC 583 Research III is a continuous course beginning in quarter 8 with grade and credit given upon completion in quarter 13.

Minimum Hours Required for Degree = 117

Research Activities

Members of the department are increasingly involved in identifying research projects in occupational therapy. The students participate in faculty-supervised evidence-based clinical outcome studies which may be carried out in one of Rush University Medical Center's occupational therapy clinics.

Service Activities

The faculty are outstanding teachers/practitioners involved in widely recognized professional and scholarly activities. They provide a full range of assessment and therapeutic services for a variety of populations. Within the Medical Center there are more than 40 dedicated occupational therapy practitioners working with pediatric, adult, and geriatric patients in both inpatient and outpatient settings. In addition, faculty and clinicians are committed to serving with professional and community organizations.

Program in Perfusion Technology

Philosophy

The Perfusion Technology program provides students with both the scientific knowledge as well as the clinical experience in order to make them effective and successful perfusion technologists. In the challenging, expanding profession of perfusion technology, today's perfusion technologist must be able to meet the daily demands of the operating room, adapt to new technologies and uses for the extracorporeal circuit, and be part of a profession growing beyond its traditional role in cardiovascular surgery which now encompasses other surgical and non-surgical specialties requiring the use of extracorporeal circuits, support devices or blood salvaging capabilities.

Admission Requirements

All applicants must have satisfactorily completed a minimum of 90 quarter (60 semester) hours in the pre-health curriculum at an accredited college or university. An emphasis on the sciences is preferred and some health care experience is desirable. Rush University does not offer the pre-health curriculum on its campus. No transfer credit is awarded for required coursework in which a grade of less than C has been earned. Required courses must be taken for a letter grade rather than a pass/fail option.

The following courses must be completed prior to enrolling at Rush University with a grade of "C" or better:

English Composition: Two courses or documented proficiency at composition II level. Although not required, applicants are encouraged to take additional courses focusing on written communication as writing skills are essential for the successful completion of Rush's perfusion program.

Mathematics and Statistics: Two college level mathematics courses and an introductory course in statistics.

Natural and biological sciences: 24 quarter (16 semester) hours. Science coursework must include:

Two semesters of inorganic chemistry or its equivalent in quarter hours

One semester of organic chemistry or its equivalent in quarter hours

Two semesters of physics or its equivalent in quarter hours

One semester course in human anatomy or its equivalent in quarter hours

One semester course in human physiology (or its equivalent in quarter hours) with a laboratory component OR

One semester course of combined Anatomy and Physiology (or its equivalent in quarter hours) with a laboratory component

Some community college introductory science classes may not be comprehensive enough to satisfy the prerequisite requirements. If you have any questions about courses please contact College Admission Services at (312) 942-7100 to speak with a counselor.

Social Sciences: 20 quarter (14 semester) hours. Coursework must include:

Introduction to Psychology
Introduction to Sociology

Other social science courses may include psychology, sociology, economics, history, and anthropology.

Humanities: 12 quarter (8 semester) hours.

Humanities courses include religion, philosophy, foreign languages, literature, or the history of art, music, theater, film, or dance. Studio art classes, instrumental music classes, and speech classes are not acceptable.

In addition, it is highly recommended that the perspective students observe a minimum of two procedures requiring the use of cardiopulmonary bypass, under the supervision of a clinical perfusionist.

Curriculum

The curriculum in perfusion technology combines rigorous didactic research curriculum with a strong and diverse clinical experience. Students take courses in anatomy, physiology, pathophysiology and pharmacology. The clinical experience includes participation in adult and pediatric open heart procedures at Rush University Medical Center and at affiliated hospitals. The curriculum begins in the fall quarter and covers seven quarters, including one summer session (see curricular outline). Faculty include experienced, licensed perfusion technologists and cardiovascular and transplant surgeons, in addition to specialists from anesthesia, nursing, clinical laboratory sciences and other related health professions. A unique feature of the program is the emphasis on management techniques as they relate to the administration of the hospital perfusion department. Graduates of the program will be qualified to sit for the certification examination of the American Board of Cardiovascular Perfusion.

Academic Progression. The faculty reserves the right to request the withdrawal of any student whose conduct, health or performance demonstrates lack of fitness for continuance in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University. High academic performance in required courses is expected. Only grades of A, B, or C may fulfill degree requirements in all required courses. A student receiving a grade of D or F in a required course must repeat the course and earn at least a C to remain in the program. As most courses are offered only once each year, a student may have to defer enrollment until the course is offered again. A grade of D or F in a course that is a prerequisite to another required course may also prevent a student

from continuing to progress in the normal sequence. Only one D or F is allowed per academic year, and no more than two are allowed in the entire program. The Program Performance and Academic Review Committee must approve any exception to these policies. Perfusion students will be considered in good standing, unless placed on academic probation. Academic probation is assigned to any student who earns a quarterly grade point average (GPA) below 2.5 (A=4.0) or whose cumulative grade point average falls below 2.5. Students placed on probation have two quarters in which to regain the status of good standing. Failure to do so will result in dismissal from the University.

Academic Policies*

The Perfusion Technology program requires full-time enrollment beginning with the fall quarter of the junior year and continuing through the spring quarter of the senior year, a total of seven consecutive quarters of classroom work and clinical experience.

* Additional policies are listed in the Academic Information section.

Educational Activities

The faculty of the department is responsible for providing both the didactic coursework and the clinical experiences necessary for the Bachelor of Science degree with a major in perfusion technology. The program is accredited by the Accreditation Committee - Perfusion Education (AC-PE) of CAAHEP.

Service Activities

Faculty members are licensed perfusionists actively involved in the daily clinical activities of the Department of Extracorporeal Services.

Perfusion Technology Curriculum

Fall		(Total Qtr. Hours: 15)
HSM 510	2	Health Care in America
PRF 301	3	Introduction to Perfusion Technology
PRF 331	3	Anatomy
PHY 551	4	Advanced Physiology I
NUR 510	3	Biostatistics
Winter		(Total Qtr. Hours: 13)
PRF 333	3	Pharmacology
PHY 552	2	Advanced Physiology II
PRF 311	3	Junior Seminar I
PRF 302	5	Pathophysiology of Cardiopulmonary Bypass I
Spring		(Total Qtr. Hours: 14)
PRF 381	3	Introduction to Research and Project Design
PRF 303	6	Pathophysiology of Cardiopulmonary Bypass II
PRF 312	5	Junior Seminar II
Summer		(Total Qtr. Hours: 15)
PRF 441	2	Project Design and Research I
PRF 313	3	Junior Seminar III
PRF 431	10	Clinical Experience I
Fall		(Total Qtr. Hours: 13)
PRF 442	2	Project Design and Research II
PRF 432	10	Clinical Experience II
PRF 451	1	Senior Seminar I
Winter		(Total Qtr. Hours: 13)
PRF 443	2	Project Design and Research III
PRF 433	10	Clinical Experience III
PRF 452	1	Senior Seminar II
Spring		(Total Qtr. Hours: 13)
PRF 444	2	Project Design and Research IV
PRF 434	10	Clinical Experience IV
PRF 453	1	Senior Seminar III

Minimum Hours Required for Degree = 96

Department of Religion, Health and Human Values

About the Department

The Department of Religion, Health, and Human Values offers the Master of Arts degree in Health Care Ethics, a Certificate of Graduate Study in Health Care Ethics, and a Certificate of Graduate Study in Spirituality and Health. In addition, the department provides courses and resources addressing a variety of topics including death and dying, narrative in health care, suffering, etc. The department maintains an active program of research into the relationship between spirituality/religion and health. It also maintains a strong program of Clinical Pastoral Education.

Master of Arts in Health Care Ethics

While caring for the sick is an ancient ethical responsibility, its commitments must be met new each day. Each generation of health care practitioners must traverse the threshold separating the ethics of ordinary life from the ethics of treating and caring. Practitioners learn to negotiate their way among professional standards, institutional and public policies, the demands and needs of patients/families/clinicians, and their own personal moral standards. Some generations must address new ethical quandaries created by medical science and technology, pressures to lower spending, new delivery organizations, and by clinicians' ordinary struggles with their humanity. Always, the ethical mandates to avoid harm, do good, honor the dignity and freedom of the person, and seek justice persist. The Master of Arts in Health Care Ethics assists health care professionals to strengthen and deepen their understanding of health care ethics in today's scientific, technological, organizational, economic and spiritual contexts.

Objectives of the Master of Arts in Health Care Ethics

- Provide ethical analysis of cases
- Provide ethical commentary during rounds and conferences
- Recommend ethically appropriate clinical or administrative interventions
- Provide health care ethics education
- Develop or revise policies related to health care ethics
- Describe the impact of values and the influence of social/environmental contexts on delivery of health care
- Provide informed public comment about current health care issues
- Identify and pursue issues that require formal research

Program Focus and Content. Because we believe that ethical responsibility has to be understood in context, the program features courses in three core areas:

- Contexts (Health policy, health care organizations, health law)
- Foundations (Health care ethics, research, and counseling)
- Application (Practica, ethics consultation, and thesis)

Curriculum (subject to change)

Fall

HSM 560	3	Health Care Policy
HSM 502	3	Health Care Organizations
HHV 501	3	Introduction to Health Care Ethics
HHV 505	1	Ethics in Research
HHV 551	2	Practicum I

Winter

CDS 575	3	Issues in Counseling
CDS 581	3	Research Methods in Communication Disorders
HHV 502	3	Major Issues in Health Care Ethics
HHV 598	1	Thesis
HHV 552	2	Practicum II

Spring

HSM 543	4	Health Law
HHV 503	3	Seminar in Health Care Ethics
HHV 553	2	Practicum III*
HHV 598	1	Ethics Thesis

Summer

HHV 512	4	The Clinic and the Classics
HHV 554	3	Ethics Consultation*
HHV 598	4	Ethics Thesis

*Includes 2-4 weeks Geriatric Interdisciplinary Team Training (GITT) in Spring or Summer.

Admission

It is strongly recommended (but not required) that applicants have some previous coursework in philosophy, ethics, human behavior, and English composition. Applicants for the Master of Arts in Health Care Ethics must meet the following requirements: 1) Graduate of an accredited undergraduate and/or professional program, 2) GPA of 3.0 in most recent degree work, and 3) Completion and submission of the Graduate Record Examination (GRE) or appropriate examination for the applicant's professional field (LSAT, MCAT, GMAT, etc.)

Application Process. Applicants submit a completed application with a $40 non-refundable application fee, as well as official transcripts from every institution of higher education attended. Three letters of recommendation are also required. Deadline for application is August 1st for entry in the fall quarter.

Academic Policies*

Academic Progression. Students in the Master of Arts in Health Care Ethics program must achieve a grade point average of 3.0 (A=4.0) in all coursework each quarter to maintain satisfactory academic status. Academic probation results when a student's grades fall below a quarterly or cumulative GPA average of 3.0 or when a student receives a grade of F in any course. Any health care ethics student may be placed on academic probation when the student's academic deficiencies are significant as judged by the Committee on Academic Progress and Promotions. A student on academic probation shall remain so until he/she has remedied all deficiencies and met all requirements established by the committee for removal from academic probation. Students placed on academic probation will be notified by letter from the program director following a meeting of the Student Progress Review Committee. The letter will explain the reasons for the probation and the specific requirements which must met to re-establish good standing.

A student who earns a grade of F in a required course must repeat the course. Failure to earn a grade of C or better in a repeated course will result in dismissal from the University. A student who earns a grade of F in two or more required courses will be dismissed from the University. The faculty reserves the right to request the withdrawal of any student whose conduct, health, or performance is unsuitable for a health profession. Any such student who does not withdraw voluntarily will be dismissed from the University.

Full-time and Part-time Enrollment. Full-time enrollment enables students the best opportunity to maximize their opportunities. The program, however, may be taken part-time. Full-time students are expected to maintain continuous enrollment until degree requirements are completed. A student who needs to suspend his/her studies must petition the department for a leave of absence. Leaves of Absence for more than four consecutive quarters are not allowed.

Graduation Requirements. The program requires a cumulative GPA of 3.0 or greater to graduate. All degree requirements must be completed within seven years from matriculation into the program. The minimum number of quarter hours required for graduation is 45. Students fulfill the quarter-hour requirements by registering in required courses, successfully petitioning to transfer credits, or successfully petitioning to waive a required course. If a course is waived, students must take a course or courses equaling the number of credit hours of the waived course.

* Additional policies are listed in the College of Health Sciences and the Academic Information sections. Students are expected to know and follow these additional policies.

Certificate of Graduate Study in Health Care Ethics

Since 1998, the Department has offered a Certificate of Graduate Study in Health Care Ethics online via the Internet. The course occurs "asynchronously," that is, there is no scheduled class time when students and faculty meet face-to-face. Consequently, people interested in ethics can pursue the certificate no matter where they live or work in the world. The Certificate of Graduate Study in Health Care Ethics consists of three separate courses taken in the order listed. Each course carries three credits for a total of nine credit hours. Students are encouraged to take the classes during one academic year, but may take them over a longer period of time.

HHV 501 Introduction to Health Care Ethics
HHV 502 Major Issues in Health Care Ethics
HHV 503 Seminar in Health Care Ethics

Admission Requirements. 1) Graduate of an accredited undergraduate and/or professional program, and 2) GPA of 3.0 in most recent degree work.

Application Process. Applicants complete the online application found at www.rushu.rush.edu/onlineclasses/hhv.

Certificate of Graduate Study in Spirituality and Health

Scientific research has supported what many people have long believed: spirituality and religion can be important to good health. Religion and spirituality are associated with positive coping, meaning/purpose/hope, positive mental well-being and other health outcomes. The Certificate of Graduate Study in Spirituality and Health is a twelve credit academic program integrating spirituality, community and culture as resources for health, and examining ethical responsibilities for fostering health. It combines classroom instruction (some of it online), personal reflection, advising, and small-group work to facilitate students achieving the following goals:

- To explore issues related to spirit, mind and body
- To understand ethical, societal and cultural dimensions of health
- To integrate spirituality into health care practice
- To become better resources for health in the community

The Certificate of Graduate Study in Spirituality and Health is intended for nurses, social workers, occupational therapists, physical therapists, and other health care providers, as well as clergy and other spiritually-oriented helping professionals who want to deepen their understanding of the interaction of spirituality and health. The Certificate of Graduate Study in Spirituality and Health consists of the following courses (subject to change):

HHV 501 Introduction to Health Care Ethics
HHV 535 Spirit/Mind/Body
NUR 522 Health Promotion and Disease Prevention
BHV 524 Cultural Diversity in Health Care

Admission Requirements. Applicants for the Certificate of Graduate Study in Spirituality and Health should be graduates of an accredited undergraduate program.

Application Process. Please submit the following to Rush University/College Admission Services, 600 S. Paulina, Suite 440, Chicago, IL 60612:

1. A current curriculum vitae
2. Transcript(s) of relevant education
3. Letter of intent stating how the program will enhance the applicant's current work

Vascular Ultrasound Program

Description of the Profession

The vascular sonographer plays a vital role in the diagnosis and treatment of patients with disorders of the arteries and veins including atherosclerotic (plaque and cholesterol buildup), clotting, and aneurysm problems. A vascular sonographer is responsible for taking the patient's history, performing the appropriate test on the patient using ultrasound and other technology, acquiring and analyzing the pertinent data, and preparing a report of the data and images for the physician to interpret. The vascular sonographer has extensive, direct interaction with patients, physicians, co-workers, and other hospital personnel.

Philosophy/Mission

The mission of the Vascular Ultrasound Program is to teach students the knowledge and skills necessary to accurately perform vascular ultrasound examinations on patients in a caring manner, analyze the results, and clearly communicate the findings to the interpreting physician. A secondary goal is to offer a broader understanding of the profession through laboratory management, professional practice, and research areas.

Admissions Guidelines

1. A minimum of 90 quarter (60 semester) hours earned at an accredited college or university is required.
2. The recommended minimum GPA is 2.75 on a 4.0 scale.
3. Intermediate college level math is required with a grade of C or better.
4. Human anatomy and physiology and physics are highly recommended for admission.
5. Other college credits should be primarily in the science and math areas. Suggested courses in these areas are biology, pathophysiology, chemistry, statistics, and algebra. Courses in communication (verbal and written), psychology, sociology, and ethics are recommended.
6. A letter confirming the applicant's observation of a vascular ultrasound examination is required.
7. Three recommendations are required.
8. An interview is scheduled for selected applicants following review of the application materials.
9. Applicants who have taken their prerequisite coursework at a university outside the United States must have their coursework evaluated by the Education Credential Evaluators (ECE). Test of English as a Foreign Language (TOEFL) need to be submitted for those students whose native language is not English.

Program Description

Students in the Vascular Ultrasound program are taught by vascular sonographers and physicians who are experienced practitioner/teachers in the field. This is a full-time program that consists of twenty-one months (seven quarters) of study. The first year (junior year) consists of nine months of classroom, student laboratory work, and observation of patient exams. At two to three clinical sites during the second year (senior year), students practice on patients, implementing the vascular techniques learned in the junior year. Students work with registered vascular technologists in accredited vascular laboratories. The clinical sites include the five university hospitals in Chicago, as well as some community hospitals. Students return to Rush at scheduled times during the senior year for continuing didactic training and to present patient cases. Students earn a Bachelor of Science degree and are eligible to take the certification examination in vascular ultrasound after graduation.

Curriculum

First Year

Fall Quarter		(Total Qtr. Hours: 16)
HSM 510	2	Health Care in America
VAS 301	3	Vascular Anatomy, Physiology, and Pathophysiology
VAS 311	3	Physical Principles and Ultrasound Physics I
VAS 312	1	Physical Principles and Ultrasound Physics I Lab
VAS 321	3	Patient Care Practices
VAS 322	1	Patient Care Practices Lab
VAS 331	2	Venous Procedures
VAS 332	1	Venous Procedures Lab
Winter Quarter		(Total Qtr. Hours: 14)
VAS 313	3	Physical Principles and Ultrasound Physics II
VAS 341	3	Arterial Procedures
VAS 342	1	Arterial Procedures Lab
VAS 351	3	Cerebrovascular Procedures
VAS 352	1	Cerebrovascular Procedures Lab
VAS 405	3	Laboratory Management
Spring Quarter		(Total Qtr. Hours: 15)
VAS 361	3	Abdominal Vascular Procedures
VAS 362	1	Abdominal Vascular Procedures Lab
VAS 371	3	Advanced Vascular Testing and Topics
VAS 372	1	Advanced Vascular Testing Lab
VAS 381	3	Research
VAS 382	1	Research Lab
VAS 401	3	Professional Practice

Second Year

Summer Quarter		(Total Qtr. Hours: 12)
VAS 411	11	Clinical Practicum I
VAS 431	1	Senior Guest Lectures/Case Presentations I
Fall Quarter		(Total Qtr. Hours: 12)
VAS 412	11	Clinical Practicum II
VAS 432	1	Senior Guest Lectures/Case Presentations II
Winter Quarter		(Total Qtr. Hours: 12)
VAS 413	11	Clinical Practicum II
VAS 433	1	Senior Guest Lectures/Case Presentations III
Spring Quarter		(Total Qtr. Hours: 12)
VAS 414	11	Clinical Practicum IV
VAS 434	1	Senior Guest Lectures/Case Presentations IV

Minimum Hours Required for B.S. Degree = 93

Academic Progression

High academic performance is expected in required courses. Students will be considered in good standing at Rush University unless placed on academic probation. An annual cumulative GPA of at least 2.5 and 2.0 for the junior and senior year respectively, is required to be eligible to continue in the program. A grade of C or higher in the required courses is required to be eligible to continue in the program. The faculty reserves the right to request the withdrawal of a student whose conduct, health, or performance demonstrates lack of fitness for continuance in a health profession. Any such student not voluntarily withdrawing will be dismissed from the University.

Academic Probation

Academic probation is assigned to any student who receives a "D" grade in a required course, a quarterly grade point average below 2.5, or whose cumulative GPA falls below 2.5. Students placed on probation have one quarter in which to regain good standing. Failure to do so will result in dismissal from the University.


RUSH UNIVERSITY
THE GRADUATE COLLEGE
1975

"The pursuit of science is more than just obtaining a degree. It is understanding the gravity of the pursuit, its implications for the future health of the nation, as well as the shear thrill of discovery. Just imagine what it must feel like to discover a new fact that could significantly affect the lives of future patients, and then recognize that you are the only person in the world that knows about it. At Rush, this happens every day. The faculty of The Graduate College understand this pursuit, and more importantly, know how to show others how to do it. We understand that discovery is both noble and humbling while at the same time intellectually stimulating and just plain fun. We attempt to organize our program around these principles with focus on patient. It is truly a unique environment."

Paul M. Carvey, Ph.D.
Acting Dean, The Graduate College

Mission

The primary mission of The Graduate College of Rush University is to promote and assure excellence in educational programs in selected disciplines of the medical sciences. The Graduate College promotes cooperative efforts in achieving high quality educational and research programs to prepare students for successful careers and life-long professional development.

Philosophy

The Graduate College has been established to provide opportunities for students to work with selected members of the University faculty to earn graduate degrees with emphasis on the doctoral level in many of the sciences basic to health care. This limited goal, coupled with highly individualized programs, maximizes the students' opportunities for self-realization and the faculties' opportunities for sharing their scholarly development, expertise, and experiences on a personal basis. The organizational pattern allows a high degree of faculty and student participation in the educational affairs of the college. Each division's faculty members are active in basic medical research and education, providing opportunities for the advanced student to engage in a research program leading to the degree of Doctor of Philosophy. The Graduate College faculty strives to provide individualized and flexible scholarly paths for its students. It avoids arbitrary imposition of uniformity and the encumbrance of unnecessary formality while simultaneously maintaining educational excellence. The faculty believes that such an environment permits independent thinking and high motivation for students' continued learning. Achievement of such a climate requires adaptation to the needs of students with the limitation in numbers of students implicit in such an approach.

Program

The Graduate College prepares students for the master of science and doctor of philosophy degrees. The Doctor of Philosophy is awarded in recognition of high achievement in a particular field of scientific research as evidenced by submission of a dissertation that demonstrates the power of independent investigation and contributes to the body of existing knowledge. An undergraduate record of scholastic excellence is an important background for The Graduate College experience. The Graduate College also provides excellent research and training opportunities for advanced students who want to enroll concurrently in The Graduate College and in Rush Medical College. The process of application review includes a search for evidence of creativity and scholarly potential in the applicant. Non-degree students are not admitted with advanced degree objectives and are ineligible to become candidates for advanced degrees. Upon approval by a course director, any individual may audit a course. In all cases, a student considering application for admission should first establish contact with the director of his/her choice of program to determine divisional requirements. The student must meet all of the requirements for progress and graduation in the division's graduate studies program. In this regard individualized studies will be programmed to meet the student's need in achieving essential knowledge in preparation for these requirements.

Core Curriculum

In September 2004, all students entering The Graduate College will take the new core curriculum course series. This curriculum is designed to enhance interaction among students from all the programs while, at the same time, providing the basic knowledge base the faculty have deemed necessary to become successful in science. The core curriculum runs for three consecutive quarters (fall, winter and spring) and provides introductory training in molecular genetics, genomics and protein biology, cell biology, tissue biology, and cell signaling. Students will also learn basic theory underlying modern scientific technique. In addition, the student will take courses in ethics, scientific writing, and basic statistics. These core courses will be supplemented by advanced courses offered by the individual divisions.

The following courses comprise The Graduate College Core (GCC) curriculum:

GCC 501 Molecular Biology: Genome to Proteome
GCC 502 Cellular Biochemistry: Proteins, Transport and Signaling
GCC 503 Functional Cell Biology
GCC 504 Functional Tissue Biology
GCC 505 Techniques in Biomedical Sciences
GCC 506 Biomedical Ethics
GCC 507 Medical Research Strategies
GCC 508 Writing Practicum

Professional Master's Degree in Biotechnology

In September 2005, The Graduate College plans to offer a one-year, non-thesis master's degree designed to prepare the student for a career in the pharmaceutical and biotechnology industries. The student will take the core curriculum series. In addition, the student will take a course covering principles of physiology and pharmacology. Students will also be able to take elective courses offered by The Graduate College divisions to tailor their interests. These didactic courses, however, will form only one part of the student's training. Trainees in this program will also participate in intense, hands-on laboratory work designed to familiarize the stu-

dent with research techniques widely used in industry, including surgery. This experience will ensure proficiency in a wide variety of techniques making the student highly competitive for employment in this ever-expanding and understaffed job market.

The following courses comprise the proposed Biotechnology curriculum:

Fall Quarter (16 qtr. hours)
GCC 501 Molecular Biology: Genome to Proteome
GCC 502 Cellular Biochemistry: Proteins, Transport & Signaling
GCC 503 Functional Cell Biology
GCC 505 Techniques in Biomedical Sciences
GCC 521 Critical Reading
GCC 522 Problem-based Learning
GCC 531 Laboratory Techniques I
(good laboratory practices, data management)
GCC 532 Laboratory Techniques II
(study design, surgical techniques)

Winter Quarter (16 qtr. hours)
GCC 504 Functional Tissue Biology
GCC 505 Techniques in Biomedical Sciences (continuation)
GCC 506 Biomedical Ethics
GCC 521 Critical Reading
GCC 522 Problem-based Learning
GCC 533 Laboratory Techniques III
(electrophoresis, genomics, transformation, transfection, PCR)
GCC 534 Laboratory Techniques IV
(tissue culture, cell sorting)
PHR 504 Introduction to Physiology and Pharmacology

Spring Quarter (16 qtr. hours)
GCC 507 Medical Research Strategies
GCC 508 Writing Practicum
GCC 521 Critical Reading
GCC 522 Problem-based Learning
GCC 535 Laboratory Techniques V
(ELISA, chromatography, densitometry/imaging)
GCC 536 Laboratory Techniques VI
(histo- and immunochemistry, microscopy)

Admission

The faculty of The Graduate College encourages diversity among the student population and therefore, seeks to admit persons from various backgrounds. The Graduate College uses the following guidelines to evaluate candidates for admission. Individual divisions within the college may have additional requirements and criteria for admission. Applicants are encouraged to first check with the division of interest. The College's requirements are as follows:

1. All applicants must have earned at least a bachelor's degree or its equivalent.
2. A cumulative grade point average of 3.0 on a 4.0 scale, or equivalent, from the most recent degree is required.
3. All applicants (except those admitted to Rush Medical College) are required to take the Graduate Record Examination (GRE) aptitude test and have their scores submitted. A combined score for the verbal and quantitative sections of 1,000 is desirable. A score of 3.5 or higher on the analytical writing test is considered the minimum performance level. Medical students enrolling at Rush can substitute MCAT scores for the GRE. The MCAT must have been taken within five years of the planned quarter of enrollment with a minimum score of the 50th percentile for the year in which the exam was taken.
4. All applicants whose native language is not English are required to take the Test of English as a Foreign Language (TOEFL). A minimum total score of 550 is required on the paper-based examination and 213 on the computer-based examination.
5. Each applicant is required to submit three letters of recommendation.
6. Specific admission requirements may be waived by The Graduate College Council. These will be addressed on a case-by-case basis.

Applicants who consider themselves to have a special or unique qualities that make themselves strong candidates for graduate education are also encouraged to apply. Research and related job experience are valued highly in the admissions process and will be taken into account. Interviews with applicants are generally required and can play a significant part in the admission decision. Beyond these measures, the faculty attempts to determine the applicant's motivation and potential for advanced study and a research career in the sciences. Once The Graduate College admissions office has received all required documents, including the application fee, it forwards the application to the division for review. If the division does not wish to offer admission to the applicant, the division makes that recommendation to the Dean, who notifies the applicant. If an applicant meets all the college and division admission criteria and the division agrees to admit the student, the admissions office is notified and the Dean writes to the applicant. If an applicant does not meet the college criteria as outlined above, but the division wishes to admit the student, the applicant's admission materials are sent to The Graduate College Council, where a review of the applicant takes place and an agreement to accept or reject is made following a presentation of the candidate to the Council by the division. The Dean then notifies the applicant of the Council's decision.

Organization

To facilitate its educational mission, the College is organized into divisions; each division represents a separate discipline and each is related to its parent academic department. Currently, the College has the following divisions:

- Anatomy and Cell Biology
- Biochemistry
- Immunology/Microbiology
- Medical Physics
- Pharmacology
- Neuroscience
- Molecular Biophysics and Physiology

The primary goal of each division is to provide excellent graduate education in the sciences basic to medicine. The divisions of the College are flexible and responsive to the changing needs and experiences in their disciplines. To that end, divisions are headed by directors who serve for definite terms of appointment and whose

re-appointments are subject to periodic review. Each division reports through its director to the Dean of The Graduate College and is a member of The Graduate College Council. The Graduate College Council is the senior representative body of the college. Its membership includes all division directors, an elected faculty member from each division, and two students elected by the students annually. Only the elected members and students are allowed to vote. The Dean serves as the chairman of the council. The council is responsible for setting policies for the admission of students; the formulation and adoption of general operating policies, standards and procedures of the college; the appointment of graduate college faculty and the approval of those recommended for degrees. Although the Dean and the Council hold ultimate responsibility for programs of The Graduate College, the divisions of graduate study retain significant authority in structuring and administering their programs. The faculty of The Graduate College is drawn from the faculty of the other colleges of Rush University. No faculty member has a primary appointment in The Graduate College. No ranks are associated with appointment to the faculty, and all faculty in The Graduate College are designated members.

Doctor of Philosophy

The degree of Doctor of Philosophy (Ph.D.) is the highest degree conferred by Rush University. The Ph.D. is restricted to those scholars who have demonstrated superior ability in a recognized academic discipline. While each division has identified requirements, the Ph.D. degree is not awarded following the completion of any specific number of formal courses nor on the basis of miscellaneous course studies and research. The entire Ph.D. program must be integrated and be highly research-oriented. It should culminate in a work of literary and scholarly merit, which is indicative of the candidate's ability to conduct original research in a recognized specialty. Ph.D. programs are directed by selected faculty who work closely with graduate students. In practice, each program is composed of formal courses, guided individual study in a chosen field or discipline, study in such cognate subjects as may be required by the candidate's advisory committee, and original research that serves as the basis of a scholarly dissertation.

Thesis and Dissertation. A doctoral student must complete a dissertation. This document is developed through faculty-guided independent research projects. Review of the dissertation will follow the sequence of steps described in the manual Preparation of Theses and Doctoral Dissertations. Copies of this manual are available in each graduate division and in the Library of Rush University. The dissertation must be original and cannot have been used to meet the requirement of any other degree, either at Rush University or any other university. Each student will have a Dissertation Committee whose role it is to assure that the student's dissertation is of high quality and meets the standards of the division, the college and the university for originality, contribution to the field and scholarly presentation. The Committee is also to assure that the student is making satisfactory progress toward completion of the degree. Additional policies of the committee are available from division directors or the Dean's office.

At or near the completion of the dissertation, each student will share, by means of a public presentation with the academic community at large, the knowledge that the student has developed. Students are responsible for posting announcements (at least two weeks prior to the presentation) on institutional bulletin boards that contain the title of the dissertation, the student's name, and the location, date and time. This public presentation must precede the final approval of the dissertation by the Dissertation Committee.

Academic Progression. Specific regulations governing the process which results in final awarding of the degree are developed by the graduate division responsible for the candidate's progress. While such regulations differ from one division to another, each division's program and regulations are reviewed for approval by The Graduate College Council. In all cases, graduate divisions are required to be explicit and clear about regulations that will affect the candidate. This must be stringently observed in divisional regulations concerning selection of principal advisors, advisory committees, and a plan of study. Similarly, divisions will be explicit and clear concerning academic policies and procedures surrounding qualifying, preliminary, and final examinations when they are required. The divisions are also responsible for providing the candidate with the support needed to plan and conduct the thesis or dissertation research. At the same time, a major responsibility of the student is to become familiar with the regulations and expectations of his/her chosen division. These regulations and expectations are included in the university Bulletin within the section devoted to each divisional program and within program publications. It is considered to be the student's responsibility to remain knowledgeable about these program regulations as they are set forth; they may change from time to time. Some divisional programs may require the student to take one or more courses at a university other than Rush. It is the responsibility of the director of the graduate division concerned to make arrangements enabling satisfaction of such course requirements and to inform the student, prior to admission, of such costs and special arrangements as may be necessary.

Admission to Candidacy. Admission to candidacy is evidence that the doctoral student has successfully completed all required courses and has prepared to move into his/her intensive research experience. Admission to candidacy is a demonstration of confidence that the student will successfully accomplish the remaining requirements of the program.

Academic Policies*

The Graduate College adopts college-wide policies and procedures and reviews division regulations. Students follow the college and division policies in effect at the time of initial matriculation in The Graduate College. However, The Graduate College reserves the right to make substantive changes in its programs after the student's matriculation. Students will be informed in writing by the division director of any changes made during their tenure in the program. Students re-entering the college after an absence will be guided by policies and procedures in effect at the time of re-entry.

Transfer of Credit. Subject to the approval of the major advisor and the division director, graduate level courses taken at other institutions may be applied to the graduate degree requirements at Rush if they are judged to meet divisional requirements. Grades from courses transferred from another institution are not recorded on the student's academic record; the number of credits is recorded and added to the cumulative number of credits.

Proficiency Exams. Students can proficiency out of any subject or course the division deems necessary. Such a proficiency exam must establish objective criteria and provide a proficiency exam that is suitable for the level of the course. The division will keep a copy of the exam in the student's file. Passing a proficiency exam given by a division will appear on the student's Rush transcript as a course passed for that division and the record of such must be transmitted to the Office of the Registrar to be official. There will be no tuition charged for proficiency credit.

Credit Hours. Rush University is on a quarter system. The quarter hour is the unit used by the College of Nursing, the College of Health Sciences, and The Graduate College to determine credit for courses taken. As a general rule one quarter hour represents one lecture hour, two hours of small group discussion, or three laboratory hours per week. Each quarter is at least ten weeks in length. An examination period is provided at the end of each term, and most classes give a final examination during this time.

Examination Policy. The examination policy is the responsibility of the individual course director who will inform students of examination requirements for that particular course. A period at the end of the quarter is provided for examinations. This period may be used as the course director chooses.

Pass/No Pass Grades. Each division identifies all courses required of its students. Required courses are usually taken for grade and not under the pass/no pass (P/N) option. Research hours are generally graded using the P/N option. However, a division may opt to provide a letter grade for research classes (under 600) for master's students. The grading policy for post-candidacy research hours (over 600) for doctoral students is P/N.

Incomplete Grades. The grade of incomplete ("I") is normally given only when circumstances beyond the control of the student prevent completion of course requirements and the student has received permission to defer completion of these unmet course requirements. The course director shall determine what work will be required to remove the incomplete and shall establish a specific time frame within which the student must complete such work, not to exceed one calendar year. No student may graduate with an incomplete grade on his/her academic record. Upon completion of the unmet course requirements, a new grade will replace the incomplete grade. A student who fails to remove the incomplete grade within the specified time period will receive a final grade of F.

* Additional policies are listed in the Academic Information section.

Academic Standing

Good Academic Standing. To remain in good academic standing, students must maintain a cumulative grade point average of 3.0 and meet the requirements of his/her division. A student must be in good academic standing to be admitted to candidacy and to graduate.

Academic Difficulty. Each division has policies and procedures regarding students who fail to maintain good academic standing. While the responsibilities of informing students of their academic problems and of establishing conditions for regaining good academic standing reside with the divisions, The Graduate College Council monitors the progress and promotion of all students and gives final approval to award students' degrees.

Dismissal. Grounds for dismissal beyond minimal criteria established by The Graduate College are determined by each division. Should a division recommend the dismissal of a student, the director will forward such recommendation to The Graduate College Council for final action. Letters of dismissal come from the Dean. Appeal of a dismissal action begins within the appropriate division.

Full-time enrollment. Full-time enrollment is required of all graduate college students with the exception of the M.S. in Clinical Research degree. Students must register for at least 12, but not more than 18, quarter hours per quarter. Students must obtain written permission from the division director for exceptions to this policy. Students receiving a master's degree from The Graduate College as a full-time student must be enrolled for a minimum of three quarters (12 hours/quarter). Part-time students earning a master's degree must be enrolled a minimum of two quarters/academic year. The minimum requirement for graduation from the college is 48 hours with a minimum of 24 completed as a student in the College. At the time of graduation, the student must be enrolled in the College. The maximum time allowed for enrollment for a master's degree is four years starting the first quarter of official enrollment.

Residency. Ph.D. candidates are expected to meet all requirements for graduation within five enrolled academic years in the graduate college (excluding leaves of absence (see below)). This period begins the quarter in which the student formally matriculates. A student exceeding that time limitation must submit to the Graduate Council, in writing, a request to extend their candidacy beyond that time period. This request must identify the reasons for the extension and provide a written plan with reasonable deadlines for completion. This document will be co-signed by the student's advisor and division director. The council will then vote whether to accept the extension or not (passed by simple majority). The student's advisor will then provide an update on the student's progress after six months. One year after the extension is granted, the student is expected to complete all requirements. A second request may be made by the student's advisor and division chair, but only will be accepted through a two-thirds majority of the voting members present at a formal hearing of the Graduate Council. Within one year of that second request, the student must complete all requirements for the Ph.D. or face dismissal. Alternatively, the student may be awarded a M.S. degree upon the recommendation of the student's graduate division.

Study at Another Location. If a student proposes to maintain active status in The Graduate College while at another location, approval by the division director and The Graduate College Council will be necessary. Such a student will enroll each quarter with the Office of the Registrar of Rush University for zero hours of credit, and will be charged the enrollment fee at the rate in effect at that time.

Leave of Absence. If a student finds it necessary to interrupt his/her studies for a period of time, a Petition for Leave of Absence form (available from the Office of the Registrar) must be completed by obtaining all authorized signatures. The student is also required to submit a written statement to the division director specifying the circumstances. All decisions regarding the conditions of the leave and of the re-entry into the program will be communicated to the

student by the division. No leave of absence may exceed one calendar year (see Academic Information Section).

Withdrawal from the University. Students withdrawing from the University voluntarily must complete a Petition for Withdrawal form (available in the Office of the Registrar). The student will obtain the necessary signatures and return all Medical Center material, identification cards, and keys. Withdrawal is final once all Medical Center bills have been paid and the completed form is submitted to the Office of the Registrar. Unless granted a formal leave of absence, regular graduate students who fail to register for three quarters in each academic year, depending upon divisional requirements, are considered to have withdrawn from the University and must compete for readmission with other applicants. (See Academic Information Section)

Readmission. Any student who has withdrawn from the University or any dismissed student may apply for readmission by submitting an application for this purpose to the College Admission Office. An interview may be required. A re-entering student must meet the conditions for re-enrollment stated in his/her dismissal or re-entry acceptance letter and all policies, requirements and course sequence in effect at the time of re-entry. The student will pay tuition and fees at the rates in effect at the time of re-enrollment. Application deadlines may vary by division.

Committees of The Graduate College

The Graduate College Council. The Graduate College Council is the senior representative body for The Graduate College. The committee is comprised of all program directors, an elected representative from each division, and two elected student representatives. The Graduate College Council is chaired by the Dean of The Graduate College. Only elected members are allowed to vote.

Student Academic Appeals Procedure

Any student of The Graduate College may appeal a final course grade, failure on a preliminary or comprehensive examination, or failure of the thesis/dissertation that results in his/her academic probation or dismissal from the University. A student may also appeal an unreasonable delay in his/her graduation from the University. No other issues may be appealed through this process.

The process for filing an appeal is maintained by each division. The student may request a copy of the Division Appeal Process from the Division Director. This process will be completed within one quarter. If a resolution cannot be achieved at the Division level, the following procedure must be followed. At any step in the process, the student may withdraw the appeal by written notification to the program director with a copy to the Dean. In the event of a dismissal decision, a student may continue to enroll until the appeal process is completed or the student withdraws the appeal.

Step 1: If the student wishes to appeal the decision beyond the Division, within two weeks of receiving a decision from the Division, the student will submit a written statement to the Dean requesting consideration of his/her case by an advisory panel. The student must provide the following in the written statement.

a. Course number and grade being appealed or other cause for probation or dismissal, i.e., failure of preliminary/comprehensive examination or thesis/dissertation
b. Action being requested
c. Justification for the request
d. An outline of the efforts and actions already taken to obtain consideration of the request.

The student will send copies of this communication to the Division Director and the Department Chairperson. In addition, if a course grade is being appealed, the student will send a copy to the course director. If the evaluation of a thesis or dissertation is being appealed, the student will send a copy to the chairperson of the thesis/dissertation committee. The Advisory Panel will be The Graduate College Council. Its Chairperson will be appointed by the Dean from among the members. The Division Director of the student's division and any other member who is evaluating the student's academic status will not vote.

Step 2: Within two weeks after notification to the Dean, the Chairperson of the Advisory Panel will arrange a meeting of the advisory panel. It will submit a written recommendation to the Dean.

Step 3: Within two weeks following receipt of the advisory panel's recommendation and upon discussion with the student and with others as appropriate, the Dean shall reach a final decision and notify each party of the decision. The decision reached by the Dean is final.

The issues discussed and the outcomes of all meetings in this appeal process are documented. This record-keeping is the responsibility of a faculty member who is to be designated at each meeting. Copies of the documentation should be distributed to the individuals present at a meeting, to the Division Director, the Dean and to the student's academic file.

Curriculum Committee. This committee reviews all courses and programs of study, including new programs and courses, and makes recommendations to The Graduate College Council.

Division of Anatomy and Cell Biology

Philosophy

The Division of Anatomy and Cell Biology offers study both at the master's (M.S.) and doctoral (Ph.D.) levels. The master's degree requires a thesis on a laboratory-based research project. The programs are intended for students interested in research and in acquisition of strong foundations in functional human anatomy and tissue biology. The principal, although not exclusive, focus of research in the department is on the biology of skeletal disease, repair and regeneration. This work is founded in strong interdisciplinary alliances with the Department of Biochemistry with its strong cartilage and connective tissue research program, the Department of Orthopedics with its the gait and biomechanics laboratory and the Section of Rheumatology. All of these academic entities form the Rush Arthritis and Orthopedics Institute.

The scope of this work with its underlying orientation to skeletal and joint disease provides an excellent forum for graduate study. A premium is placed on conceptual development, critical thinking in the formulation of research questions, and the development of projects that can not only be translated to effective grants and publications but to effective presentations of ideas in the research or educational setting.

Exploration of structure-function relationships is an exploding frontier for the contemporary anatomist in the medical research setting. Anatomists, as most scientists, are reinventing themselves and their fields in the study of basic disease processes. New tools for visualizing structure and partnerships with other scientists are propelling them toward better understanding of molecular processes as they are organized in three-dimensional space of cells, tissues and organs. This collaborative environment, both in education and research, is a great source of intellectual vigor and personal enrichment.

Admissions

Applicants are encouraged to complete their application files by April 1st preceding the intended date of admission since the course cycle begins in the fall quarter. Applications, however, will be considered on a rolling basis, particularly for applicants to the master's degree program who wish to do concurrent M.D./M.S. study or who seek advanced standing for post-professional master's work (see below).

The Division of Anatomy and Cell Biology seeks students whose backgrounds demonstrate motivation toward research and teaching as well as a capacity for independent study. Consideration is given to the student's area of interest with respect to the expertise of individual faculty. Acceptable academic and test performances (GRE/TOEFL) are dictated by Graduate College guidelines (3.0 GPA; >50th percentile GRE). Preferences for majors in biological sciences should include laboratory experience as well as course experience in anatomy, physiology, cell and molecular biology, and embryology/developmental biology. Students with backgrounds supporting interests in biomechanics or kinesiology should contact the Program Director.

Specific divisional admission requirements may be waived at the discretion of the Graduate Advisory Committee in Anatomy and Cell Biology for advanced placement in either the master's or doctoral programs.

Programs of Study and Curriculum

Doctoral Degree in Anatomy and Cell Biology. The first and second year curricula are devoted to anatomy coursework and complementary electives selected from cell and molecular biology, physiology, biochemistry, pharmacology, immunology, biostatistics, and ethics in research. Methods and special topics courses during the first year help the student select and work more closely with his/her research advisor and identify project lines for dissertation research. Participation in the departmental journal club is expected each quarter. This is primarily a research-based degree, but doctoral students are also required to serve as instructional assistants in the core anatomy courses to improve their comfort level in working with students and anticipating future roles in teaching. Admission to degree candidacy for dedication to dissertation research is contingent upon successful completion of: 1) course and teaching requirements, 2) a written comprehensive examination, and 3) a dissertation proposal to be presented to the student's dissertation committee for approval.

The **master's degree in Anatomy and Cell Biology** is a research-based degree requiring a thesis based on laboratory or experimental work of limited scope. There is some flexibility in selecting courses to meet the master's degree requirements. The core courses that students select to meet these requirements are minimized in order to direct students' efforts to their thesis projects beginning in the first year. Completion of the full course complement and thesis research would ordinarily take two years. Advanced placement and M.S./M.D. options are described below.

Required Coursework	**Ph.D.**	**M.S.**
Core Anatomy Courses**	32	15-17
(ANA 513 Anatomy I, ANA 514 Anatomy II, ANA 511 Histology, and ANA 512 Neurobiology)	(all four)	(two of four)
ANA 505 Embryology**	4	4
ANA 581 Research Methods in Anatomy	4	4
ANA 590 Special Topics in Anatomy	2	2
Electives (recommendations below)	8**	3**
GCC 571-578 Cell/Molecular Biology	[3]	[3]
PVM 546 Biostatistics (or equivalent)	[3]	[3]
Other (*other core or extradepartmental)	[2]	*
Teaching Assistantships (Ph.D. only)	9	N/A
Journal Club (ANA 595)	9	6
Research (ANA 598 or 699)	72	12-14
Minimum Hours	**140**	**48**

Core courses are based on corresponding courses in Rush Medical College, but include an enrichment component for graduate students. In these sessions students are encouraged to explore material from historical or contemporary perspectives in the literature, perform and demonstrate special dissections, and to discuss special topics with opportunities to present material to their cohorts.

Weekly journal clubs on selected topics provide an opportunity for students to discuss papers under faculty supervision. These sessions expose students to methods and experimental studies outside the mainstream of their laboratory setting. The journal club provides experience in critical review of literature with a focus on experimental design and presentation and interpretation of data. Faculty participation in these discussions helps broaden students' perspectives.

M.D./Ph.D. or M.S./M.D. Tracks and Advanced Placement

The programs in Anatomy and Cell Biology are well-suited to students interested in combined M.S./M.D. or M.D./Ph.D. tracks because of significant overlap in required coursework for these tracks. Exemptions are ordinarily permitted for courses taken as medical students at Rush or other institutions, subject to review by the departmental Graduate Advisory Committee.

A concurrent **M.D./Ph.D.** track would typically follow a traditional 2-3-2 plan, with three years devoted to doctoral study between the medical preclinical and clinical programs. Students in this track should consider applying for partial support at Rush through its "Physician-Scientist" program. This program provides tuition forgiveness for one of the last two medical school years.

The **M.D./M.S.** track provides an opportunity for medical students to engage in research training and to fulfill the thesis requirement without significant additional coursework. This thesis research would ordinarily be completed in an additional year between the student's second and third medical school years.

M.S. with Advanced Placement. An advanced placement track is available for residents or clinical fellows who may be afforded extended time to pursue research. Students or graduates of Rush or accredited United States or Canadian medical schools are eligible for this advanced placement track. The Graduate Record Examination (GRE) is ordinarily required, although applicants can petition for an exemption based on their MCAT scores. Proficiency exams administered by the program may be required to validate competency in certain areas or to help set up program plans. International medical graduates will be considered on a case-by-case basis. Their eligibility is based on TOEFL and GRE scores as well as undergraduate medical records and recommendations. The Advanced Placement track recognizes the medical course background of the applicants by exempting them from anatomy/histology/neurobiology core course requirements. The emphasis is on research, laboratory-based training, and project development with the completion and defense of their master's thesis.

Academic Policies

The Division is bound by academic policies of the University and The Graduate College listed in The Graduate College and Academic Information sections.

Assessment of Progress. The student's progress will be assessed continuously based upon performance in the courses taken and upon evaluations by the Graduate Advisory Committee in Anatomy and Cell Biology. Good academic standing necessary for graduation requires maintenance of a cumulative grade point average (GPA) of 3.0. Students who fail to earn at least B grades in courses within the division, or whose overall GPA falls below 3.0 are placed on probationary status for review of their progress by the Graduate Advisory Committee. Pending this review, any student on probation, may be recommended for a remedial action, or for dismissal from the program. An outline of these specific academic policies and grievance mechanisms is accessible on the departmental web site; a printed version may be obtained from the Graduate Program Director.

Guidance. Each entering student is guided in his/her course of study by the Program Director with the assistance of the Graduate Advisory Committee until such time as the student determines a course of dissertation/thesis scholarship and selects a Research Advisor. The Research Advisor must hold an appointment in the Division of Anatomy and Cell Biology. The Research Advisor assists the student in development of a dissertation/thesis proposal, selection of a dissertation/thesis committee, and in oversight of the dissertation research and writing. The student, in consultation with the Research Advisor and Graduate Program Director, is responsible for assuring that his/her graduate coursework satisfies requirements of both the Division and The Graduate College for completion of the degree.

Thesis Requirements for Master's Students

After completion of their core course requirements and initiation of their research, students identify a master's thesis committee (three members) and present their thesis proposal for review. This proposal is ordinarily scheduled toward the end of summer after their first year. Completion of the study, the thesis, and its presentation and defense are to be completed by May in order to qualify for a June graduation.

Candidacy Requirements for Doctoral Students

Preliminary Examination. After completing the course requirements, the student must take the preliminary examination in order to qualify for degree candidacy. This examination emphasizes the student's ability to synthesize material, to solve problems and to communicate verbally and in writing. The first part of this examination consists of a written, comprehensive examination on course material. The second part, an oral examination, is based on the student's dissertation proposal.

Dissertation. Upon completion of both parts of the preliminary examination, the degree candidate devotes his/her time mainly to dissertation research and writing. The dissertation must be an original experimental or applied study; its format and review must comply with requirements of The Graduate College. The candidate must present the work in a University-wide forum and defend the completed dissertation before his/her research committee. This dissertation committee should be comprised of five members with at least one member from outside the division. An extramural committee member is recommended.

Research Activities

Research in the Department of Anatomy and Cellular Biology stresses the pathobiology of tissue repair and regeneration in connective tissue (especially bone and cartilage), nerve and the eye. Many of these studies are directed to developing modes of protection against injury, or finding ways that growth factors and cytokines can promote healing in experimental models. Biomedical projects, closely allied to problems encountered in the clinical setting, are enriched by collaborative work with the Departments of Orthopedic Surgery, Biochemistry and Ophthalmology and the Section of Rheumatology. Students are encouraged to perform research in cross-disciplinary areas to take advantage of opportunities in the medical environment at Rush to develop basic research problems with a disease orientation. In addition to the biomedical research detailed below, faculty have interests in the development of new educational constructs that use computers to facilitate instruction and applied learning through case study work. Faculty laboratories are located in the Armour Academic Center and in the Cohn Building, a new research building on campus. These laboratories support a variety of projects ranging in scope from cell and tissue culture work using molecular probes and biochemical methods to experimental surgery and studies on biomechanics and gait. There is ready accessibility to scanning and transmission electron microscopy, a confocal microscope, mechanical testing equipment, and a bioinstrumentation laboratory as well as opportunities in specialty laboratories throughout the Medical Center. Most faculty members collaborate not only with other researchers at Rush, but with investigators elsewhere in the United States and abroad.

As a small department, a premium is placed on close relationships between students and their faculty mentors for guidance in development of new projects. The department normally hosts post-doctoral M.D. or Ph.D. investigators who are committed to related lines of investigation and who are valuable resources for students. Highlights of faculty research interests in the department include:

Bone biology and orthopedics. Methods of enhancing bone regeneration for improving fixation of orthopedic implants (e.g. for joint replacement) are being investigated in experimental models and in patients. These studies feature mechanisms by which bone adapts to altered mechanical stresses and to the presence of foreign materials in these devices. The role of growth factors and cytokines is being studied in these models. (Sumner, Leven, Virdi)

Bone biology and the bone marrow stroma. Mesenchymal stem cells in the bone marrow stroma can give rise to a number of cell lineages, including osteogenic, chondrogenic, myogenic and adipogenic. Isolation and characterization of the early progenitors has a great potential for their use in clinical situations of tissue repair and regeneration. Our research interests focus on molecular studies using gene-expression profiling and the role of these cells as vehicles for delivering growth factors to the site of repair. (Virdi, Leven)

Joint pathophysiology. The pathophysiologic processes that produce damage to joints and articular cartilage are being examined in experimental models. Possible approaches to protecting cartilage from damage and inducing cartilage repair are being studied as a means to restore articular surfaces damaged by trauma or osteoarthritis. The role of bone in the development and progression of osteoarthritis is controversial. Several of our recent studies have suggested that bone may play a critical role. (Williams, Muehleman, Sumner)

Novel imaging of cartilage and bone. Diffraction enhanced imaging (DEI) is a high spatial resolution x-ray based method that relies on diffraction and scatter rejection (extinction) in addition to absorption. DEI appears to be able to detect cartilage degeneration even in early stages of diseases such as osteoarthritis and may facilitate detection of microdamage in bone. This methodology may one day allow the radiographic detection of both cartilage and subchondral bone changes simultaneously, in the development of degenerative joint disease, including osteoarthritis. (Muehleman, Sumner)

Nerve and spinal cord regeneration. Experimental models of nerve injury and methods for assessment of recovery are being used to evaluate treatments that can promote nerve regeneration. These models are directed to clinical problems of urinary incontinence and mechanical forms of nerve injury such as compression and stretching. (Kerns)

Regulation of platelet formation. Tissue culture studies on control of platelet production by megakaryocytes emphasize the factors promoting maturation of these cells, the role of receptors influencing adhesion to extracellular matrix and cytoskeletal transitions involved in this process. (Leven)

Ocular biology. The structural basis of lens opacification (cataract), lens structure/function relationships as a consequence of aging, cataract formation and ocular/systemic diseases, and fiber cell elongation/migration in normal lens and models of cataract are being investigated. (Al-Ghoul)

Retinal ischemic injury. A model for testing therapeutic approaches to protect against cellular injury in stroke focuses on neuronal injury, cell death, and microcirculatory responses to ischemia in the retina. (Hughes)

Division of Biochemistry

Philosophy

The Department of Biochemistry offers the Ph.D. degree and, under certain circumstances, the M.S. degree. The Ph.D. is the principal objective of the Graduate Program. All recipients of this degree acquire a thorough knowledge of normal biochemical processes that take place in the human organism, leading to the development of knowledge and skills of potential benefit to health care delivery. The Ph.D. is awarded following the successful defense of a research dissertation, which demonstrates the ability of the student to perform and present original scientific work. Prior to this, the student must have completed all course requirements with a minimum average grade of B (3.0/4.0) and passed the Ph.D. Preliminary Examination. The Department also offers concurrent M.D./Ph.D. as well as Doctor of Podiatry D.P.M./Ph.D. Programs, where students of Rush Medical College or Scholl's College of Podiatric Medicine may become enrolled in The Graduate College.

The goals of the Graduate Program in the Department of Biochemistry are to provide high quality education, practical training, and research opportunities to students interested in practicing basic and applied medical biochemistry at molecular and cellular levels. The term "medical biochemistry" has often been applied to describe the Department's scholarly direction. The Department thus endeavors to develop those professionals who, through their research activities, will substantially improve health care delivery to the public. Our program trains students in the application of chemical, physical and molecular biological methods and principles to the solution of biological problems, especially those of biomedical importance. A graduate of our program should have the knowledge, skills, perspectives and understanding to produce quality, self-directed scientific work. Since we are in a time of enormous and rapid advances in Biochemistry and Molecular Biology, the knowledge and skills taught in the program are soon replaced or augmented. Thus, we endeavor to train the student to recognize and utilize the interaction between observation, experiment and theory. Most importantly, the candidate should also demonstrate that oral, written and visual communication skills have been acquired. Members of the Department of Biochemistry's faculty conduct a broad range of extramurally funded research activities. A strong interaction exists between practicing clinicians and members of the Department of Biochemistry, sometimes leading to full consolidation of research programs.

The diverse interests of the faculty provide investigative expertise in the areas of connective tissue biochemistry, etiology of arthritis, regulation of gene expression, mechanisms and regulation of tumor cell invasion, leukemia and cancer cell biology, cell membrane and lipid biochemistry, human reproduction and the application of clinical biochemistry to medical problems. Some of these research programs are joint efforts with other departments, giving the student an opportunity to interact with investigators in other disciplines as well as with clinicians and physician scientists. The departmental laboratories are fully equipped with instrumentation required for modern research in biochemistry, tissue culture, and molecular biology. Several faculty members are involved in the operation of hospital clinical biochemistry laboratories and perform basic as well as developmental research work related to human disease. These laboratories are available for student training. The clinical biochemistry laboratories are modern, automated, and computerized high-volume service facilities.

Admission

Students are normally admitted in the fall quarter, but the Graduate Program Committee may at its discretion recommend admission for the winter, spring, or summer quarter. Applications may be submitted at any time during the year, preferably before March 1st. Applications for admission to the program will be evaluated by the Graduate Program Committee of the Department of Biochemistry and in special cases the Graduate College Council. Applicants are encouraged to visit Rush University for an interview. Consideration for admission will include overall academic record, results of the GRE, recommendation of the referees, and especially interview results. Students must meet all Graduate College requirements. Applicants to the joint M.D./Ph.D. program must first be accepted by Rush Medical College. However, those applicants who are not admitted to the medical college may apply to the Ph.D. program and their applications will be processed in the usual manner. Transfer students with an advanced degree in science may, upon the recommendation of the Graduate Program Committee, be admitted to the graduate program in biochemistry with advanced standing. The extent of advanced credit will be determined by the Graduate Program Committee on an individual basis through its credentials subcommittee. All advanced level entrants are urged to see the credentials subcommittee before matriculation.

Minimum requirements for admission to the Graduate Program include a bachelor's degree in any scientific discipline with a minimum grade point average (GPA) and Graduate Record Examination (GRE) scores as defined by the Graduate College. More specific departmental course requirements are as follows: one year of general chemistry, one year of organic chemistry, one semester or quarter of analytical chemistry, one year of general biology, one year of intermediate or advanced biology, mathematics through calculus, and one year of physics. One semester of physical chemistry and one semester of biochemistry is recommended but not required. Students may be accepted with less than the minimum course requirements upon special action of the Graduate Program Committee, which may waive such requirements or require that the deficiency be made up during the student's first year of graduate study.

Financial Assistance

The University determines tuition for full-time graduate students; however, tuition has historically been waived for all students in the Ph.D. programs. Most students accepted by the Department receive a research scholarship (stipend). The research scholarship awarded to graduate students is a privilege, which is contingent upon satisfactory academic progress on the part of the student. No special application for this stipend need be made; the applicant must merely indicate in his/her cover letter that such a stipend is desired. Additional financial aid, including loans, is available

through the Rush University Student Financial Aid Office. It should be noted that the student is expected to be a full-time student. Part-time jobs are highly discouraged. The advisor who will then inform the Director of Education in writing must approve any special circumstances that necessitate a part-time job. It is intended that graduate students receive their stipends from the Department of Biochemistry until the student has passed his/her Preliminary Examination and, at the end of the first academic year, has selected a permanent advisor. From that time on, it will be the obligation of the student's advisor to provide the student with financial support, including a stipend, from his/her extramural research funds, as the student can now devote more time to research. A student who has passed the Preliminary Examination is also eligible, through his/her advisor's recommendation, to apply for the Professor Alvin Dubin Fellowship, which is awarded for one academic year only. Only U.S. and Canadian citizens/permanent residents are eligible for this award. Mrs. Beverley Dubin funds the Professor Alvin Dubin Fellowship in memory of her late husband, Professor Alvin Dubin, who for many years was an active and dedicated member of the Department of Biochemistry.

The research scholarship (stipend) is awarded to students for a period of five years with the understanding that they will devote their full time to graduate study activities and that they will make satisfactory progress toward the Ph.D. degree. "Satisfactory progress" includes, but is not limited to, pursuit of the prescribed didactic course program for the first two years of graduate study, identification of a research advisor by the end of the third quarter, sitting for the Preliminary Examination in the fall preceding the second academic year, presenting a research proposal by the end of the second academic year as specified by Departmental Rules and Regulations, and pursuing research activities toward the student's dissertation with due diligence and effort. The Graduate College has mandated that the Ph.D. must be awarded within seven years following matriculation. However, the Department of Biochemistry will enforce a five-year deadline, but will allow extensions that are justified and approved by the Graduate Program Committee.

Curriculum

Introduction. The Ph.D. degree is a research degree conferred in recognition of proficiency in research, breadth and soundness of scholarship and a thorough acquaintance with a specific field of knowledge as determined by the faculty. To attain these goals, the curriculum includes the following:

1. A core of required biochemistry courses, which provides the basis for the students to pursue their own, specialized research programs.
2. A variety of elective courses, which provide the students with the flexibility to tailor their coursework to their research interests or needs.
3. Initiation of research as soon as possible following completion of the Preliminary Examination at the end of the student's first academic year.

During the first year, the student will complete all required biochemistry courses. By the end of the second year, the elective course requirement should be completed. By the end of the spring quarter of their first academic year, before they become doctoral candidates, the students are encouraged to submit three names of potential advisors in order of preference in writing to the Director of Educational Programs, who will present the names to the Chair of the Department for presentation to and final approval by the Graduate Program Committee.

At the end of the summer quarter of the student's first academic year (usually at the beginning of September; the academic year begins with the fall quarter), the student sits for the Preliminary Examination, which is a combination of a written examination, take-home examination and oral examination. By the end of his/her second academic year (i.e., before the fall quarter of the student's third academic year begins) the student is required to submit and defend a written dissertation proposal before the student's Dissertation Advisory Committee. Following this, the successful student continues his/her research work, as approved by the Dissertation Advisory Committee. Stipends are incrementally increased after completion of the Proposal Presentation.

When the student's advisor and his/her Dissertation Advisory Committee agree that the student has completed his/her task, which occurs at an announced "Permission to Write Meeting," he/she writes a dissertation, which is defended in a public seminar and in a separate executive session with the student's Dissertation Examination Committee. Another requirement is that one or more manuscripts, based on the student's dissertation work, be published, accepted, or submitted for publication in a full-length peer-reviewed journal, with the student listed as first author. To participate in the June graduation ceremony, all requirements for the Ph.D. degree must be met by mid-May.

Required formal courses for the Ph.D. degree. Any portion of this may be waived for advanced students on a case-by-case basis as recommended by the Credentials Subcommittee.

Quarter hours required. Total credit hours required for full-time student status and for graduation are determined by the Graduate College. The student must check with the Office of the Registrar before anticipated graduation as to whether or not all formal Graduate College requirements have been met.

Required courses. A total of 53 quarter hours of formal course work are required, as shown:

BCH 571 Medical Biochemistry for Graduate Students -10 quarter hours
(2 quarters)
BCH 572
BCH 581 Biochemical Methodologies - 8 quarter hours (2 quarters)
BCH 582
BCH 583 Scientific Writing - 2 quarter hours
BCH 595 Journal Club - 6 quarter hours (3 quarters)
BCH 624 Connective Tissue Biochemistry - 3 quarter hours
BCH 531 Cell Biology - 3 quarter hours
BCH 698 Introduction to Research - 1 quarter hour (2 quarters)
BCH 597 Seminar - 9(6) quarter hours (9 quarters for Ph.D., 6 for M.S.)
IMM 510 Ethics in Research - 1 quarter hour
Electives 10 quarter hours

Total formal coursework = 50-53 quarter hours

A full-time student registers for a minimum of 12 credit hours each quarter. Credit hours not allocated to formal courses are made up by BCH 699 (Research). However, a student should register for at least one BCH 699 credit each quarter even though the student may not have begun dissertation laboratory research. A student not taking any formal courses must register for 12 hours in BCH 699. The ten elective hours may be selected from other courses offered by Biochemistry or from courses offered by other departments, or other universities. Electives can be taken only after consultation with the student's advisor and Director of the Educational Programs and final approval by the Director. All formal biochemistry courses taken by the student must carry a letter grade (A, B, C, or F), except BCH 597, 698 and 699, which are taken for a Pass/No Pass grade. Students must obtain a grade of B or better in BCH 571 and 572, the Biochemistry "Core" Courses. Courses taken outside the department may be taken on a Pass/No Pass basis, unless otherwise determined by the Director of Educational Programs. The Department's seminar program and the weekly workshops are to be considered as part of a student's research experience. Attendance at seminars is mandatory throughout the entire graduate study at Rush regardless of whether or not the student is registered for BCH 597. Attendance at the workshops is highly recommended because they can greatly assist a student in preparing for and conducting their dissertation work. Since many of the themes presented at the workshops relate to dissertation projects, students may be queried as to their knowledge of workshop presentations at their "Dissertation in Progress Meetings."

Suggested program. A suggested program for the Ph.D. student is displayed herein. Please note that all required courses are to be taken in the first and second years of the student's tenure at Rush University. Electives are normally taken during the second year. A research advisor should be selected by the end of June of the student's first year, or earlier. Students are expected to remain on campus during the summer quarter, registering for 12-quarter hours of BCH 699 (unless taking a formal course). The summer quarter provides a welcome opportunity to do uninterrupted research work.

Reasonable vacation time is permitted after consultation with the student's advisor and two weeks are allowed annually, according to NIH fellowship guidelines:

(Suggested program of studies for Ph.D. students)

Year 1

Fall		
BCH 571	5	Medical Biochemistry I
BCH 581	4	Biochemical Research Techniques
BCH 595	2	Journal Club
BCH 597	1	Seminar
BCH 531	3	Cell Biology I
BCH 699	1	Research in Biochemistry
Winter		
BCH 572	5	Medical Biochemistry II
BCH 582	4	Biochemical Methodology
BCH 595	2	Journal Club
BCH 597	1	Seminar
Electives	3	Research in Biochemistry
BCH 699	3	Electives
Spring		
BCH 624	3	Connective Tissue Biochemistry
BCH 583	2	Scientific Writing
BCH 595	2	Journal Club
BCH 597	1	Seminar
BCH 698	1	Introduction to Research
-Select Advisor		
Summer		
BCH 699	12	Research in Biochemistry
BCH 699	1	Research in Biochemistry
-Preliminary Exam		

Year 2

Fall		
BCH 597	1	Seminar
BCH 699	8	Research in Biochemistry
	3	Electives
Winter		
BCH 597	1	Seminar
BCH 699	8	Research in Biochemistry
		Ethics Course
	3	Electives
Spring		
BCH 597	1	Seminar
BCH 699	8	Research in Biochemistry
	3	Electives

*Dissertation proposal (or whenever the course if offered during the academic year)

Summer		
BCH 699	12	Research in Biochemistry

Year 3

Fall		
BCH 597	1	Seminar
BCH 699	11	Research in Biochemistry
Winter		
BCH 597	1	Seminar
BCH 699	11	Research in Biochemistry
Spring		
BCH 597	1	Seminar
BCH 699	11	Research in Biochemistry
Summer		
BCH 699	12	Research in Biochemistry

Subsequent years: BCH 699 (12) each quarter (unless further electives are also taken) until successful dissertation defense.

Statute of limitations and Leaves of Absence. A student must complete his/her Ph.D. degree requirements within five years of matriculating at Rush in the Department of Biochemistry, excluding any leaves of absence. Extensions of this limitation may be granted under unusual circumstances on a quarter-by-quarter basis upon petition to the Director of Educational Programs, who will act, based on the advice of the Graduate Program Committee.

Extramural experience. Selected students will have an opportunity to spend one quarter in a basic science research laboratory in an industrial organization or another recognized research institution of higher learning in the U.S. or Europe. It is expected that work in the extramural laboratory will aid the student in his/her dissertation research work. The students will be selected for this experience upon written application to the Director of Educational Programs through guidelines established by the Department.

Concurrent M.D./D.P.M. and Ph.D. programs. A student who has been admitted to, or is currently attending Rush Medical College, may apply for admission to the concurrent M.D./Ph.D. program in the Department of Biochemistry. The program is tailored to each individual student's needs. Normally, the student first completes the required pre-clinical courses at Rush Medical College and passes Step 1 of the USMLE. The student may then begin work in the Graduate Program, which should require no more than three additional years. Following the completion of graduate work, the student resumes his/her studies in the clinical clerkships. Resumption of the M.D. program is permitted only upon assurances by the Department of Biochemistry that the Ph.D. work has been completed. Alternately, the medical student may complete the medical college requirements for graduation before starting work toward the Ph.D. degree. The participant in the concurrent M.D./Ph.D. program will be expected to fulfill the requirements set by the Credentials Subcommittee of the Graduate Program Committee. This would include formal course requirements at the appropriate level, passing of the Preliminary Examination, and submission of a high quality dissertation based on original research work. Many formal course requirements for the Ph.D. degree will be met by the Rush Medical College pre-clinical courses. It is expected that most if not all formal course requirements will be completed by the end of the first academic year in the program. The remainder of the student's time is expected to be spent in research activities. The M.D./Ph.D. program must be completed within seven years. Alternately, a student may enter the M.D./Ph.D. program through the Medical College, which identifies a maximum of two M.D./Ph.D. students per year at the time of their admission to Rush Medical College. Such students receive medical school tuition waivers for the fourth year of their medical education, providing they complete requirements for their Ph.D. degrees before resuming their third year medical studies. The details on this program may be obtained from the Office of the Dean of Rush Medical College.

Clinical Research (of the Division of Pharmacology)

Rush University Medical Center is one of the largest university-based health care providers in the Midwest and ranks eighth in the country for NIH funding among academic hospitals. Rush serves an extremely diverse patient population. The breadth of its served population offers Rush a unique opportunity for research as evidenced by its 15 percent annual growth in grant dollars over the last ten years and its commitment to clinical research. At Rush, the preclinical and clinical sciences are seamless, with both interacting intensively at almost every level of its health care delivery programs. The Master of Science in Clinical Research program is designed to capitalize on this interactive atmosphere and will involve didactic lectures and clinical research opportunities taught by both clinical and basic researchers.

Career Goals and Objectives

The clinical research program is a product of an NIH initiative to increase the number of trained clinical investigators in the United States. This K-30 training program was awarded in 1999 and funding for the program is anticipated to continue through 2010. It is designed to not only provide the important methodologies needed to carry out clinical research, but to afford the candidate the possibility of picking an area of interest where they can further develop specialized skills. The program provides three identified tracks:

Clinical Pharmacology
Population Epidemiology/Outcomes Research
Advanced Clinical Trial Analysis

The Master of Science in Clinical Research degree program seeks to attract candidates who have both a keen desire to pursue an academic career in their respective disciplines and an interest in learning the methodologies required to carry out clinical research studies.

Admission

Candidates for this program must hold a doctoral degree (e.g., M.D., Ph.D., Pharm.D., nursing) and have completed at least two years of clinical training in some area of the health field. Under certain circumstances, individuals without advanced degrees may participate in the program, but are required to take the GRE in order to be considered. An application and at least three letters of recommendation must be submitted to the Dean of The Graduate College by May 1st of the admission year (the deadline for international candidates is February 1st to facilitate visa applications). Transcripts must be submitted by the deadline. Selected candidates will be invited to interview either on site or by telephone.

Applicants affiliated with the Rush System for Health or John H. Stroger Jr. Hospital of Cook County are strongly encouraged to apply. Tuition for the program will be waived for these employees. Other applicants will be charged tuition at the current rate (estimated cost for the two year program is ~$22,000).

Upon admission, the individual responsible for the student's time will be required to submit a letter of understanding to the program assuring that the student has protected time between 3:30 p.m. and 7:00 p.m. on Tuesdays and Thursdays when 99 percent of the classes are held. Although attendance in class is not mandatory, students are strongly encouraged to attend as many classes as possible.

The Curriculum

The overall aim of the program is to have trainees acquire the knowledge and skills necessary to become competent clinical researchers who can apply the principles and methods required to design, implement and evaluate scientific investigations of clinical medicine. Specific learning objectives pertain to each of three tracks that trainees will pursue in the second year of the program, namely, Clinical Pharmacology, Epidemiology/Outcomes Research, and Advanced Clinical Trials Analysis. Most didactic sessions will be conducted as small group seminars. In addition, students are expected to perform at the highest level of graduate study with selected readings, independently collecting information from all sources, including the Internet. The curriculum is structured to provide a group of required core courses over four quarters in the first year, with track electives and two core courses required in the four quarters of the second year. Additional credit hours are granted for thesis research. Students will complete a minimum of 48 quarter hours. All students are encouraged to prepare a K-23 proposal (Mentored Patient-Oriented Research Career Development Award) and can submit it to the NIH if desired. The student must also submit and receive approval of a master's thesis.

Academic Policies*

All courses will be graded as pass/no pass. A trainee who receives a no pass in a course will have an opportunity to retake the exam or rewrite the paper to reverse the no pass grade. Failure to remediate the no pass grade will automatically require the advisory committee to review the trainee's status and officially place the trainee on academic probation for a period of one quarter. In collaboration with the course director, the advisory committee will develop a remediation plan to ensure the trainee has mastery of the subject area covered. Failure in that process or receipt of a no pass grade while on probation will result in termination from the program.

*Additional policies listed in The Graduate College and in the Academic Information sections.

Thesis Advisor Selection

Additionally, during the first year, each trainee will identify an individual mentor/thesis advisor, and together they will decide upon a thesis project. The trainee will submit an abstract outlining the proposed clinical project. The advisory committee of the program will review the project and make recommendations. Once the project is approved, the mentor and trainee will choose two other members to sit on the trainee's thesis committee. At least one of the members of the committee must be a Primary or Conjoint member of the Department of Pharmacology, the degree-granting department. The trainee and mentor will then choose a thesis committee chair, who cannot be the trainee's mentor according to the policies of The Graduate College. This chair will oversee all aspects

of the trainee's thesis submission. The trainee will then present the project to the thesis committee. Following discussion of the project, the committee will agree about the expected minimal work needed to complete the thesis requirement. The trainee will prepare a project proposal setting forth the general experimental design and agreed-upon completion requirements. It will then be submitted to the advisory committee for approval. Approval for the thesis must be obtained prior to September 1st of the second year. The trainee's thesis committee, along with the trainee, will also commit to a second year track and will inform the track director prior to July 1st of the second year.

Thesis Proposal

The thesis project may take several forms. It must be a clinically-oriented project in which the trainee clearly participates. In most cases, the project will be an original clinical study that is self-contained. In this case, the trainee will be expected to participate in all aspects of the research, including design (overall and statistical), patient recruitment, informed consent acquisition, data collection, data analyses, results interpretation, and manuscript preparation or report preparation (in the case of a company contract). The project will subsequently be written up by the trainee according to Rush University thesis format (approved by Rush University Library Information Services) and approved (by signature) by the thesis committee. Due to the short duration of the program (two years), it is not always possible for the trainee to participate in all aspects of an ongoing clinical project. In many cases, the trainee will only be able to conduct a portion of a larger clinical trial. If this is the case, the thesis committee and advisory committee will require assurances from the mentor (in writing) that the entire development of the project has been extensively discussed with the trainee so that the trainee will gain a complete appreciation of the design process. In addition, a project that has already started must be completed within the intended two years of the program. This will ensure that the trainee will have access to the blinding codes for data analysis and interpretation as well as thesis preparation. In these cases, the appendix of the thesis will contain a clear statement of work performed by the trainee as well as the number of patients on which the trainee collected data. This must be at least one-third of the total patients enrolled. There are many such nationally-funded clinical trials at Rush in which a fellow could participate. Examples of such trials include the Women's Health Initiative (WHI), The African-American Study of Kidney Disease (AASK), Controlled Onset Verapamil Investigation of Cardiovascular Endpoints (CONVINCE), Genetics of Hypertension (SCOR), WISH and ENRICHD trials of women going through the menopause and cardiovascular endpoints. Other than these trials in the Department of Preventive Medicine, there are many other such trials in both the Departments of Neurology and Surgery.

Suggested Curricular Outlines

Summer

PHR 552	2	Introduction to the Regulatory Process
PVM 552	3	Principles of Clinical Research and Epidemiology

Fall

PVM 546	3	Principles of Biostatistics I
PVM 553	3	Observational Epidemiology
PVM 555	2	Introduction to Clinical Outcomes Research

Winter

PVM 551	1	Ethics in Biomedical Research
PVM 547	3	Principles of Biostatistics II
PVM 557	2	Clinical Trial Design I

Spring

PVM 554	3	Mgt. Eval. and Stat. Interpret of Clinical Trials
PVM 558	2	Clinical Trial Design II
PHR 593	2	Writing Practicum
PHR 556	2	Tools for Research

Core Courses in Second Year are:

PHR 581	1	Research Skills and Progress I, II, III, and IV (Summer, Fall, Winter, and Spring)
PVM 559	2	Research in Special Populations (Fall)
PHR 597		Clinical Pharmacology Thesis Research (or)
PVM 597		Clinical Thesis Research

Year 2 - Clinical Pharmacology Track

Summer

PHR 561	2	Drug Biotransformation

Fall

PHR 571	1	Pharmacogenetics Readings

Winter

PHR 562	3	Toxicology/Drug-Drug Interaction/Poisoning
PHR 573	1	Readings in Drug Abuse and Addiction

Spring

PHR 568	2	Advanced Pharmacokinetics

Year 2 - Epidemiology/Outcomes Track

Summer

PVM 565	3	Applications in Epidemiology and Outcomes I

Fall

PVM 566	3	Applications in Epidemiology and Outcomes II

Winter

PVM 568		Topics in Epidemiology and Outcomes Research I

Spring

PVM 569		Topics in Epidemiology and Outcomes Research II

Year 2 - Advanced Clinical Trials Analysis Track

Summer
PVM 572 2 Advanced Logistic Regression Analysis

Fall
PVM 571 2 Meta-Analysis of Clinical Trials

Winter
PVM 573 3 Econ. Eval. Of Medical Interventions

Upon completion of the specialty track, trainees continue in the thesis course (PHR 597 or PVM 597) each term until public defense of the thesis and approval by the thesis committee and the Department of Pharmacology.

Division of Immunology and Microbiology

Philosophy

The Graduate Division of Immunology and Microbiology of Rush University is committed to producing creative and productive investigators. Toward this goal, the Division supports graduate education of qualified and motivated students at the master's and Ph.D. levels. Success in graduate studies and especially excellence in research depends on determination, dedication, tenacity, hard work, and talent. Degrees are awarded to individuals who have met all Rush University and Division requirements for their respective degree, including successful completion of coursework and a research-based dissertation that is accepted by the faculty. Graduating students should be capable of independent critical thinking and effective communication of their research.

Admission

Students who have received the baccalaureate may apply for the master's or the doctoral program. It is recommended that students wishing to enter the program should have achieved a high level of competence in biology, mathematics, and chemistry. It is important that applicants be adequately prepared to engage directly in graduate study and research. Candidates usually enter the program in the fall quarter. Applications should be submitted as early as possible and no later than April 1st. Applications for admission to the program will be evaluated by the departmental admissions committee as they are received. Considerations for admission will include overall academic record, the recommendations of the sponsors, results of a recent Graduate Record Examination, and the description of the applicant's own aspirations and interests. Personal interviews will be arranged for potential candidates after the preliminary screening. Students will be admitted into the program at levels other than first year only under exceptional circumstances; this will require approval by the graduate program director.

Curriculum

The Division of Immunology and Microbiology is a participant of the integrated/core curriculum of The Graduate College. The first year encompasses core courses in molecular biology, cell biology, biochemistry, immunology, biomedical statistics, writing practicum, and research ethics. In the second year, students will specialize in one of two academic tracks, Immunology or Virology. Specialized courses and research training are offered in both areas. Immunology track students must take Advanced Immunology while Virology track students are required to take Advanced Virology. Elective courses include clinical immunology, medical microbiology, and special topics in host defense, membrane biochemistry, inflammation, and others. A variety of elective courses from other divisions of Rush University are also available.

Suggested Curriculum Schedule for Master's and Ph.D. Students:

(Note that the program holds the right to change some of these requirements in order to keep current with research and education advancements.)

Year 1:

Fall Quarter

GCC 501	Molecular Biology: Genome to Proteome
GCC 502	Cellular Biochemistry: Proteins, Transport & Signaling
GCC 503	Functional Cell Biology
GCC 505	Techniques in Biomedical Sciences
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Winter Quarter

GCC 504	Functional Tissue Biology
GCC 506	Biomedical Ethics
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Spring Quarter

GCC 507	Medical Research Strategies
GCC 508	Writing Practicum
IMM 505	Basic Immunology
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Summer Quarter

A written comprehensive exam for Master's candidate
A pre-candidacy proposal examination for doctoral candidates (described below)

Year 2:

Master's students are expected to conduct lab research towards their master's degree and only register for IMM 585 (research seminar), IMM 575 (Advanced Readings in Immunology and Virology), and IMM 571 (Laboratory Research). Master's students should present their master's thesis research to the faculty for approval by the summer of the second year after their matriculation. Ph.D. students are expected to register for the following:

Fall Quarter

IMM 598	Pre-Dissertation Research
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Winter Quarter

IMM 531	Advanced Immunology or Virology (depending on track chosen)
IMM 598	Pre-Dissertation Research
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Spring Quarter
Ph.D. students should defend a dissertation proposal to move to candidacy

IMM 598	Pre-Dissertation Research
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Summer Quarter

IMM 699	Dissertation Research
IMM 585	Research Seminar
IMM 575	Advanced Readings in Immunology and Virology

Years 3 and 4:
Every fall, winter, and spring quarter, doctoral students are expected to register for IMM 699 (Dissertation Research), IMM 585, and IMM 575. At least two Special Topic courses (IMM 590) must be taken prior to graduation. Examples of previous Special Topics courses include Current Topics in Cellular Immunology: From Bedside to Benchside, HIV Gene Structure and Function, Viral Mimicry, Toll-like Receptors, and Signal Transduction in Lymphocytes.

Academic Policies*

General Information. Upon admission, each student will be assigned by the program to an individual principal advisor who will be responsible for guiding the student's academic activities. During the first 12 to 24 months the student will carry an academic program designed for his/her own requirements through frequent discussion with his/her principal advisor, and with the Graduate Advisory Committee. This program should provide the student with a thorough grounding in immunology, microbiology, and appropriate related basic sciences and practical laboratory experience. Following the demonstration of competency in the areas encompassed by the core curriculum and other elective courses, and the acceptance of a dissertation proposal (for Ph.D. students only), students will then essentially devote themselves full time, with participation in general departmental activities, to their dissertation research. The research program will be carried out under the guidance of a designated principal advisor and a dissertation committee. Following agreement by the student, advisor, and dissertation committee that a suitable stage in the research program has been reached, the student will prepare and present a dissertation demonstrating the ability to carry out research and make contributions to the area of investigation. All students must meet the basic requirements of The Graduate College. Passage of the preliminary examination, as partial fulfillment for entrance into candidacy for the Ph.D. degree is dependent upon demonstrated competence in the fields of immunology or virology. This can be achieved by participating in the recommended program of lecture and tutorial courses of both a basic and advanced nature that may be supplemented by independent study. Other requirements, as specified by the student's dissertation advisory committee, may be met by completion of lecture, tutorial, or laboratory courses in other divisions of The Graduate College.

Courses in pharmacology, histology, pathology and statistics are considered relevant to training in immunology and virology; these are available as part of the student's academic program but are not considered essential for all students. It is anticipated that courses in some subjects considered essential for a particular student's academic program would not be available in The Graduate College. Such requirements may be met either by special arrangement with the faculty of other institutions or by enrolling in such courses available at other institutions within the geographical area. Faculty assistance in the identification of these courses and supporting tutorial instruction will be arranged. Involvement also is required in the immunology/microbiology department research conferences and journal clubs.

Graduate Advisory Committee (GAC). The GAC is an advisory committee to the Chairman of the department that participates in the administration of this program. The GAC shall make all recommendations on policies related to the graduate program. The functions of this committee are: to assist each student in the design of an appropriate academic program; to guide both the student and faculty in advisor selection and in the appointment of the dissertation advisory and dissertation examination committees; to ensure the continued satisfactory progress of the student; and to initiate any necessary changes in or additions to this program. The GAC shall review annually the progress of each student throughout the program and shall report annually to the faculty of the division on the progress of each student. The Graduate Program Director serves as the Chairperson of the GAC. The committee consists of six members: the Chairperson of the department, Program Director, an appointed faculty member by the chairman, and three elected members of the division faculty. The elected members serve a three-year term. All GAC members must have had or currently have students in good standing in our program. The GAC shall take votes on major decisions relevant to the graduate program. Voting shall consist of secret ballot and the Program Director will announce the results of the votes at the end of the meeting. The Chairman of the department is a non-voting member. A majority vote (3/5) must be reached in order for an action item to be recommended to the department Chairperson. In the case of a tie, due to an absent member, the Chairman of the department shall break that tie.

Assessment of Progress. The academic progress of each student is continuously assessed by each faculty member with whom the student has worked. Instructors are free to use whichever system of assessment they wish to apply, provided their criteria are made explicit. To be in good standing, a student must maintain a cumulative grade point average of 3.0 (A=4.0) or better. A student whose cumulative GPA falls below 3.0 will be placed on probation. A student on probation must attain a cumulative GPA of 3.0 within two quarters (excluding summer quarter). A student who receives a grade of C in more than two required courses will also be placed on probation. For any student on probation, failure to regain good academic standing within two quarters constitutes grounds for dismissal. Evaluation of the overall progress of a student is based on reports received annually from the principal advisor and the dissertation advisory committee. The reports describe the status of academic achievement, the progress of research and laboratory activities, and identify projected requirements for the remainder of the program. It should be stressed that the purpose of such assessment and examination is primarily to aid the student in achieving academic goals by determining depth of understanding of the several areas of study and, when necessary, by identifying problems in order to enlist the aid of other faculty to assist the student in his/her training. Considerable importance in this continuous assessment is placed on the student's ability to communicate.

Guided development of the skills required for both literary and verbal presentation of knowledge and ideas, as well as their formulation, is an important responsibility of the faculty in this program.

Preliminary Examination. For the master's track: A written preliminary examination is given at the end of the first year of study. This examination covers the recommended core program and successful completion is required for proceeding into candidacy.

For the Doctoral track: Students must complete the requirement for a pre-candidacy exam (PCE) by the last day of August during the first year after matriculation. The PCE consists of both a written and oral portion. The written portion is based on a research proposal submitted to an examination committee appointed by the Graduate Advisory Committee (GAC). The topic of research must be pre-approved by the GAC. The research area of the proposal must be different from the proposed research for Ph.D. dissertation. The proposal should be based on the NIH grant application format (PHS 398) and should be no more than 15 pages in length (double spaced excluding the bibliography. The oral portion of the exam will consist of a presentation based on the grant proposal and may also include basic questions in their area of interest (Immunology or Virology/Molecular Biology). Students who fail the PCE will be asked to take a written exam in a specialized area (Immunology or Virology/Molecular Biology). Failing this written comprehensive exam will result in recommendations for dismissal by the GAC to the Dean of the Graduate College. This proposal should be prepared independently by the student in an area of research that is different from his/her prospective dissertation research. Year 1 Timeline for completing PCE is below:

Note that if a date falls on a weekend, item is due the next business day:

a. April: GAC will conduct a workshop describing in detail the requirement of the PCE, how the PCE will be evaluated, and what is expected from the students. All Ph.D. students should have taken the Writing Practicum offered in the spring quarter during the first year after matriculation.
b. May 15th: The student should submit the topic of their choice to the GAC for approval. This should be either a title or a brief description of the general area of research. Detailed plans are not required but the description should be clear to the GAC as to the area of research that will be chosen. The GAC will either approve or reject this topic and notify the student by May 20th.
c. June 1st: The GAC will notify the student of the appointed examining committee.
d. July 15th: Final document is provided to each member of the examining committee and the Program Director, if he/she did not serve on the committee.
e. By August 15th: The student should have defended the grant proposal orally. The student is required to schedule a defense date. During this defense, a student's basic knowledge in his/her area of interest, either Virology/Molecular Biology or Immunology will also be assessed.
f. If a student displays poor knowledge in his/her area of interest (Immunology or Molecular Biology/Virology) or has failed the written or the oral test, he/she will be asked to take a written comprehensive exam in the deficit area that must be completed one month from the date of the oral defense. If the student fails this written comprehensive exam, he/she will risk being recommended by the GAC for dismissal from the program.

Dissertation Advisory Committee and Dissertation Proposal. Concurrent with the development of a research program and by the summer of the second year after matriculation, the following two steps should be taken and accepted by the Graduate Advisory Committee for Ph.D. students only to continue in the program:

1) Formulation of the Student Dissertation Advisory Committee (SDAC). The SDAC should be consistent with current guidelines of the Graduate College Council. Currently, the SDAC should consist of a minimum of five members (the advisor, two faculty members from our Division; this may include a co-advisor, one faculty member from another Rush Graduate Division; and an additional faculty member from either our division or outside of our division or institution). If an outside individual, not of the division, is chosen, he/she should be a faculty member of an institution of higher education, active in research in the student's area of investigation, and willing to fully participate in the SDAC. The student should have the approval of each proposed member prior to submitting their recommendation to the GAC. The chairperson of this committee shall be an active member of the Department of Immunology/Microbiology but cannot be the advisor. Each student will be required to meet with his/her dissertation advisory committee every six months. The members of the SDAC will be allowed to change with GAC approval if the project substantially changes or if the faculty is no longer appointed at Rush.

2) Presentation to and acceptance by the dissertation advisory committee of a dissertation proposal that should constitute a scholarly outline of work intended, leading to research that will contribute to existing knowledge. The proposal should include a review of the relevant literature and a detailed outline of the proposed research demonstrating an understanding of the technical and theoretical aspects of the experimental protocols. The student will be required to defend this proposal before the dissertation advisory committee and, if indicated, the Graduate Advisory Committee. This document is considered a blueprint for a suitable dissertation project at the time it is prepared and accepted. Changes in project or strategy during the student's dissertation research may be made with the approval of the advisor and the dissertation advisory committee. The written dissertation proposal should be less than 20 pages (single-spaced) in length excluding bibliography and should include:
   a. Abstract
   b. Specific aims
   c. Significance of the research including a review of the literature needed to understand and evaluate the project
   d. Preliminary findings (Preliminary data should be included, if available, but it is not necessary and presentation/defense should not be deferred to collect such data.)
   e. Experimental designs describing the rationale, experiments planned, general methods, analysis and alternatives
   f. References
   g. Tentative sequence and priorities

The dissertation proposal should be reviewed and approved by the advisor before distributing to the SDAC members. It should, however, represent the student's efforts, and not be written by the advisor. Following the oral presentation and discussion, the SDAC will meet without the student to decide whether the defense was successful and to make specific recommendations. A copy of the approved dissertation proposal should be given to the Program Director to be included in the student's file. After successful defense of the Research Proposal and the dissertation proposal, the student will be admitted to candidacy. If the proposal defense is failed, the SDAC may require that the proposal be rewritten and defended prior to the start of the fall quarter of the third year. A failure at the second defense will result in a recommendation for dismissal from the program.

Dissertation. Following admission to Ph.D. candidacy the student shall devote full time to research activities under the guidance of the principal advisor and dissertation advisory committee and shall be actively involved in all the scholarly pursuits of the Department of Immunology/Microbiology, including tutorials, seminars and journal clubs. The student is expected to seek opportunities to gain experience in teaching and to be involved in the teaching activities of the faculty to the extent that this does not interfere with the progress of the research program. Student must demonstrate research accomplishment and written communication skills by fulfilling a publication requirement. Students must have a first-authored publication submitted to a peer-reviewed journal prior to awarding the degree. To this end, students are strongly encouraged to work with their advisors and members of their SDAC to meet this requirement as soon as possible. The publication requirement should be a clear objective for the student from the moment they enter candidacy. Students can defend their dissertation prior to having a manuscript accepted for publication if he/she provides a copy of the submitted manuscript along with a letter from the journal verifying receipt of the manuscript. These two documents should be submitted to the Program Director prior to planning a defense date. A degree, however, will not be awarded until the manuscript has been accepted for publication in a peer-reviewed journal. This manuscript must be based on their primary dissertation research and not other projects in which they may have been involved. The manuscripts may be incorporated into the student's dissertation. Following at least four quarters of research activity and agreement by the student and the dissertation advisory committee that research progress is such that a dissertation may be prepared and presented, the Graduate Advisory Committee shall be notified. At least three months prior to the expected date of completion, a timetable will be set by the Graduate Advisory Committee providing a deadline for submission of the dissertation and times for presentation and defense of the dissertation. Additional examinations also may be required and a timetable will be established for these.

The Graduate Advisory Committee will appoint a dissertation examination committee for each candidate. The examination committee shall be composed of the dissertation advisory committee of the student and any additional members of the faculty of The Graduate College deemed appropriate. The dissertation examining committee may, through consultation with the Graduate Advisory Committee, request evaluation of the written dissertation by at least one scientist (external examiner) of national or international stature in the field of investigation who is not affiliated with Rush University. The role of the dissertation examination committee is to evaluate the student based on the following: presentation and general defense of the scientific basis of the dissertation in an open lecture, reports of any external examiner(s) concerning the standard of scholarly research presented in the dissertation, an oral defense before the examining committee, and approval of the written dissertation.

The dissertation examination committee may request additional examination of the student or evaluation of the dissertation before a recommendation on approval is made to the Graduate Advisory Committee. Upon agreement that the student has satisfactorily met the requirements for the award of the degree of Doctor of Philosophy, the chair of the dissertation examining committee and the program director communicates their recommendation to The Graduate College. If within ten quarters following entrance into candidacy the student has not submitted a dissertation or the dissertation advisory committee has failed to notify of an intent to submit a dissertation, the Graduate Advisory Committee may assume the role of dissertation advisory committee to evaluate the progress of the student and suggest modifications that would enable candidacy requirements to be completed within one calendar year. It is expected that students will complete the program within the five year maximum mandated by The Graduate College. Requests to the division director and The Graduate College Council for extension of enrollment beyond this period will be considered only under exceptional circumstances.

Time Commitment for Degree Completion. Master's students are expected to complete the program within two years of matriculation. Doctoral students are expected to complete the program within five years of matriculation.

Research Activities

The faculty are based in an active medical center dedicated to patient care, to the support of clinical, biomedical and basic biological research and to education in allergy, basic and clinical immunology, and microbiology. The following is a list of current active faculty and their primary research interests, as well as faculty in the Allergy and Immunology clinical program of the Department.

Lena Al-Harthi, Ph.D., George Washington University; (Graduate Program Director and Assistant Professor): Immunopathogenesis of HIV infection.

James W. Bremer, Ph.D., Baylor University; (Assistant Professor and Director, Virology Quality Assurance Laboratory): Clinical virology; Pathogenesis of HIV infection.

Alison Finnegan, Ph.D., Tufts University; (Professor): Regulation of the immune response, cellular immunology, autoimmune diseases.

Anita T. Gewurz, M.D., Albany Medical College; (Associate Professor and Head of Training Program in Allergy/Immunology): Clinical immunology; Pediatric allergy; Latex hypersensitivity.

Henry Gewurz, M.D., Johns Hopkins University; (Professor and Chairman): Mechanisms of natural resistance; Chemistry and biology of complement and acute phase proteins; and Immunobiology of inflammatory diseases and processes.

Evalyn Grant, M.D., Rush University; (Assistant Professor): Pathogenesis of asthma.

Diana D. Huang, Ph.D., University of Michigan; (Assistant Professor): Molecular basis of reovirus pathogenicity and persistence in vivo; HIV virology.

Harold Kessler, M.D., Rush Medical College; (Professor): Infectious diseases, hepatitis B viral infections; HIV infections.

Sau-Ping Kwan, Ph.D., University of Cincinnati; (Professor): Molecular genetics of immune deficiency diseases; Autism disorder.

Alan L. Landay, Ph.D., University of Pittsburgh; (Professor and Associate Chairman of the Department): Flow cytometry; Lymphocyte subpopulations in HIV infection.

Thomas F. Lint, Ph.D., Tulane University; (Professor, Graduate Program Director, and Associate Chairman of the Department): Mechanisms of complement-mediated cell lysis; Complement and HIV; Parkinson's disease.

Nell Lurain, Ph.D., Loyola University of Chicago; (Assistant Professor): Cytomegalovirus, drug resistance and pathogenesis.

James N. Moy, M.D., University of Illinois; (Associate Professor and Director of the Section of Allergy and Immunology): The role of eosinophil major basic protein and neutrophils in late-phase allergic events.

Janet Plate, Ph.D., Duke University; (Professor): Cytokine and cytokine receptor gene expression in leukemia; Molecular biology of interleukin receptors.

Gregory T. Spear, Ph.D., University of Illinois; (Professor): Role of the complement system, innate immunity and antibodies in HIV infection.

Anat Tambar, Ph.D., Hadassah Medical School at the Hebrew University, Jerusalem; (Assistant Professor): Transplantation Immunology.

Larry L. Thomas, Ph.D., University of Illinois; (Professor): Mechanisms of allergic disease; Pharmacology of human neutrophil functions; Immunopharmacology.

Lenoard A. Valentino, M.D., Creighton University; (Assistant Professor): The role of gangliosides in tumor cell adherence and metastasis.

Janice M. Zeller, R.N., Ph.D., University of Illinois; (Associate Professor): Stress and the immune response, especially in HIV infection.

Service and Clinical Activities

In addition to offering the graduate program and conducting active research programs, the department teaches immunology and microbiology to medical students, offers an allergy/immunology residency program, and maintains a close affiliation with the hospital's clinical immunology and microbiology laboratory.

Medical Physics

The Division of Medical Physics offers two programs of study and research leading to graduate degrees: Master of Science with a major in radiological sciences or Doctor of Philosophy with medical physics as the area of interest. The faculty members of the division are active in theoretical and experimental research in medical physics and its clinical applications. The faculty's diverse interests allows the division to offer graduate degree programs that can satisfy students' interests in several areas of medical physics:

Dosimetry
Imaging applied to medicine
Radiation sources
Physics of radiation therapy
Physics of diagnostic radiology
Physics of nuclear medicine
Radiation protection

In addition to the degree programs, the division offers post-doctoral training in medical physics for individuals who have doctorates in physics, physical science or engineering. The division also permits students-at-large to register for coursework.

Admission

In addition to the basic requirements established by The Graduate College, the Division of Medical Physics has requirements for admission to its programs.

Radiological Sciences Master of Science Program. The division director and the admissions committee initially evaluates applicants for admission to the program and considers the applicant's overall academic record, recommendations, scientific research interests and previous ability to pursue independent studies successfully. The program director also determines whether additional supporting evidence would aid evaluation of the application and, if so, will request more information from the applicant. The committee may also request an interview. The Graduate Record Examination (GRE), is not required, although it is highly recommended that applicants take the verbal, quantitative and appropriate advanced tests. Further information about the GRE may be obtained from the Educational Testing Service, P.O. Box 6004, Princeton, N.J. 08541-6004. Applications for admission are accepted by the division for any quarter of the year. Applicants to the program should have received an M.D. or D.D.S. degree from an accredited institution prior to enrolling in the program. The studies required for the master's degree may be carried out concurrently with a residency program provided prior approval is given by the chair of the department in which the resident is being trained. A cumulative grade point average of 3.0 (A = 4.0) is required.

Medical Physics Doctor of Philosophy Program. The Division of Medical Physics seeks students interested in research and teaching and who show a capacity for independent study in their undergraduate or graduate education. The division director and the admissions committee initially evaluate applicants for admission. The division director will determine if additional supporting evidence would aid evaluation of the application and may request more information. The director may also request an interview.

All applicants must meet the following criteria for admission:

- Hold a bachelor of science degree in physics, or a bachelor of science or engineering degree with a minor in physics, from an accredited college or university.
- Complete coursework in physics: mechanics, optics, atomic and nuclear physics, thermodynamics and quantum mechanics. If the student is deficient in physics courses, additional courses will be required.
- Completed one year of college chemistry with a laboratory component. This requirement may be satisfied within the Ph.D. program.
- Have a cumulative grade point average of 3.0 (A= 4.0) in college work.
- Have a cumulative GPA of at least 3.0 in all college science courses.
- Have prior success in pursuing independent study.
- Submit Test of English as a Foreign Language (TOEFL) results if applicants are international students.
- Submit results of the GRE taken within the last three years. The division recommends that students also submit the GRE subject examination in physics.
- Three letters of recommendation from previous college or university instructors.
- A written description of scientific research interests.

Currently, space in the Medical Physics program is very limited. Students should contact the Division before submitting an application for admission.

Curriculum

Radiological Sciences Master of Science Program. The studies required for the master's degree may be taken concurrently with the residency program, provided prior approval is given by the chair of the department in which the resident is being trained. Full-time students should complete the master of science degree in one calendar year. Part-time students will, of course, require more time. Each student will submit a thesis on his or her research and will take a final examination in defense of the thesis.

Medical Residents in Therapeutic Radiology. The following courses are required for medical residents in therapeutic radiology: MPH 457, 458, 481, 482, 483, 484, 492, 536 and 598. The sequence of courses MPH 501, 502 and 503 may be chosen as electives in the master's degree program.

Medical Residents in Diagnostic Radiology and Nuclear Medicine. The following courses are required for medical residents in diagnostic radiology and nuclear medicine: MPH 457, 458, 460, 461, 464, 465, 471, 475, 490 and 598. The sequence of courses MPH 501, 502 and 503 may be chosen as electives in the master's degree program. Other electives are available at Rush University.

Medical Physics Doctor of Philosophy Program. The Ph.D. program is intended to be completed in four to five years of full-time study beyond the bachelor's degree. The minimum residency requirement established by The Graduate College is eight quarters of full-time enrollment. During the first year, the student will be committed to completing required coursework and any deficiencies. During the second and later years, required courses will be completed, and the student will be encouraged to enroll in appropriate advanced courses within The Graduate College. Ordinarily, research begins near the end of the second year, and it will continue as the primary activity throughout the third and later years. The following courses are required:

- MPH 457, 461, 463, 471, 501, 502, 503, 505, 506 (A, B and C), 536, 565, 590, 699
- Core courses in The Graduate College

The following are elective courses offered by the Division of Medical Physics: MPH 465, 475, 481, 484, 504, 542, 566, 581, 582 and 583. Students may choose other electives at Rush University.

Academic Policies*

Master of Science in Radiological Sciences. A minimum of 48 quarter hours of required courses, including research, is required for the Master of Science degree with a major in radiological sciences. Of these, a minimum of 18 quarter hours of medical physics courses, excluding research, is required. A minor is not necessary in this program. Students must maintain a minimum GPA of 3.0. The maximum amount of medical physics credit acceptable for transfer from another institution is 12 quarter hours. There is no foreign language requirement. The time limit for completing the program is five years.

Academic Progression. The graduate program director acts as academic advisor to each new student. The director determines the course schedule with students and monitors their progress. Soon after entry, the students select the area of research they wish to consider for their master's theses. Each student seeks out a faculty member of the Division of Medical Physics who will become his or her scientific advisor. The advisor and student assemble an advisory committee of five members, at least three of whom are on The Graduate College faculty. The advisor serves as chair of the advisory committee. The committee is responsible for adapting continued coursework to the student's needs and for providing advice and evaluation at all stages of the graduate program. Specifically, the committee will evaluate the student's thesis proposal, thesis and performance at the thesis defense. Before beginning the specific thesis research, the student must present a detailed proposal, including a literature review, to the advisory committee. At that time, the student will be required to give an oral defense of the study that demonstrates his/her understanding of the study's goals and methods. When the committee is satisfied with the proposal, the student may begin the research project. Although the major advisor will closely supervise the research, it is the student's responsibility to attain the research goals.

Thesis Defense. The thesis is a scholarly work based on an original project. Its format and review by the advisory committee and dean must comply with the requirements of The Graduate College. Oral defense of the thesis serves as the final examination in partial completion of the requirements for the master's degree. The examining committee includes a minimum of five faculty members approved by the department advisory committee. At least three examiners, including the student's principal and associate advisors, are selected from within the division. Two examiners may be selected from outside the division, preferably, though not necessarily, from outside the University. Distinguished scientists may be invited as guests of the division to examine the thesis and to participate in the final defense. Passing the final examination is based upon the recommendation of the majority of the examiners. If the student fails to pass the final examination, the student may appeal to the dean of The Graduate College.

Medical Physics Doctor of Philosophy Program. A minimum of 40 quarter hours of medical physics courses (excluding research) must be completed successfully. Additionally, at least 18 quarter hours of minor course credit are required. A total of 150 quarter hours of academic credit is required for the Ph.D. degree. A maximum of 60 quarter hours of transfer credit will be accepted. There is no foreign language requirement.

Academic Progression. The graduate program director functions as academic advisor to each new student during the first year. During this time, the director determines course schedules with students and monitors their progress. Toward the end of the first year, students take a qualifying examination covering basic physics, therapeutic and imaging physics, radiation protection, transfer function analysis, and current topics discussed during the medical physics seminar series. This examination includes written and oral components. Based on the results of the qualifying examination and performance in coursework, students may be permitted to continue in the program without conditions. If a student's performance is poor, he or she may either be permitted to continue with added requirements or dismissed from the University. During the second year, the student selects the area of research he or she wishes to consider for the Ph.D. dissertation. The student should seek out a faculty member of the Division of Medical Physics who will act as the scientific advisor. The advisor and student assemble a dissertation committee of no fewer than five members, at least three of whom are on The Graduate College faculty. The department advisory committee must approve the membership of the dissertation committee. Toward the end of the second year, the student is expected to take a preliminary oral examination. This examination is given only after the student has completed all required courses and eliminated all deficiencies. At the oral examination, the student is required to:

- Demonstrate competency in general and clinical medical physics
- Demonstrate adequate knowledge in medical physics
- Defend the research proposal
- Show his or her understanding of the proposed study's goals and methods

The dissertation committee conducts the oral examination. The student's level of performance on this examination determines whether he or she is admitted to candidacy for the Ph.D. degree. Students failing to gain admission to candidacy may be retested 6 to 12 months after the original examination date. The student may begin and register for dissertation research after admission to candidacy. The dissertation committee meets with the student periodically to review progress and provide feedback. The major advisor closely supervises the research, but it is the student's responsibility to attain the research goals.

Dissertation. The dissertation is a scholarly work based on an original project. Its format and review by the dissertation committee and dean must comply with the requirements of The Graduate College. The public presentation and oral defense of the dissertation serve as the final examination in partial completion of the requirements for the Ph.D. degree. Distinguished scientists outside of Rush may be invited as guests of the division to examine the dissertation and to participate in the final oral defense. The dissertation committee examiners recommend whether a student passes the final examination.

Grievances. The department advisory committee, at the request of a student, will resolve a grievance between the student and faculty concerning:

- Course grade and preliminary examination results that may result in the student's dismissal
- Unreasonable delay in completing the dissertation research
- Failure to pass final oral defense of the dissertation

The student may appeal the decision of the department advisory committee to The Graduate College Council and to the dean, according to The Graduate College policies and procedures.

*Additional policies are listed in The Graduate College and the Academic Information sections.

Research Activities

- Study of basic mechanisms by which radiation transfers energy to biological and chemical materials
- Development of new techniques for directing and measuring various radiations used in the detection, diagnosis and treatment of cancer
- Application of radioactive tracers to diagnosis and to the study of metabolic processes
- Optimization of physical parameters for specific studies in diagnostic medical imaging including radiology, computerized radiography and tomography, as well as nuclear magnetic resonance imaging and radionuclide imaging and dosimetry in radiation therapy, radiation protection, radiobiology and hyperthermia

Rush University annually issues a report that summarizes research projects of the entire faculty.

Division of Neurosciences

Philosophy

The Division of Neurosciences of The Graduate College offers interdisciplinary education in the field of neuroscience at the doctoral level to prepare students for careers in teaching and research. The diversity of interest and expertise among the faculty of the division provides students with educational and research opportunities in neurophysiology, neuroanatomy, behavioral neuroscience, neuropharmacology, neurochemistry, cell and molecular biology - all of which are important for the understanding of the functions of the central nervous system. The resources at Rush and in the Department of Neurological Sciences allow students the unique opportunity to carry out independent research on the basic neurobiological substrates of various neurological disorders.

Admission

Designed for students interested in teaching and interdisciplinary research careers in the neurosciences, the program also accepts students with an undergraduate or medical degree as well as other professional students wishing to pursue graduate study. Students are admitted for entry during the fall quarter of a given academic year. Applicants for admission are evaluated by an admissions committee chaired by the Director of the division. Candidates are required to provide three letters of recommendation written by individuals who know them academically. Consideration for admission includes the applicant's overall academic record, the quality of the recommendations, his/her motivation and ability to pursue independent studies and the description of the applicant's scientific research interests. Minimal admission criteria to the program are consistent with the general requirements of The Graduate College and include a score of at least 1,000 on the combined quantitative and verbal components of the Graduate Record Examination and 4.5 on the analytic writing component, and a grade point average of at least 3.0.

Curriculum

Courses. The program is preceptor-based. The study and research schedule outlined below should be completed within four to five years of full-time study beyond the bachelor's degree. The minimal residence requirement established by The Graduate College, which is eight quarters of full-time enrollment of at least 12 credit hours per quarter, is followed. During the first two years, students are expected to complete required coursework (and any deficiencies). First year required courses consist of The Graduate College Core curriculum courses, the Rush Medical College neurobiology (NEU 451) course and physiology (PHY 451 and PHY 452) courses. Graduate students are expected to receive a grade of at least B in these courses. In addition, a graduate student's committee will advise the student regarding the two additional basic science courses offered by the medical school (or The Graduate College) to be chosen from among neuropharmacology, biochemistry, various courses offered in cell and molecular biology, immunology and microbiology depending on background and need for thesis research. In the summer quarter of the first year of study, all students are required to enroll in and pass a statistics and experimental design course (NEU 542). During the first two years of study, students rotate through various laboratories involved in the program and learn certain techniques commonly in use in neuroscience laboratories. The requirement is mastery of four techniques outside any of those used by the student in his/her research. The major required course in the second year of study is an Advanced Neuroscience Proseminar (NEU 591) taught jointly by participating faculty. A seminar format is used that encourages extensive discussion and student participation. A course titled "Selected Topics in Neuroscience" (NEU 690) is available to advanced students (in their third or fourth year of residence) for credit. The offerings in this course change from year to year depending on demand and interest, and the course is taught by different faculty members. In addition to coursework, students are encouraged to participate in and carry out independent research in their first two years of residence.

Academic Policies

Students are required to pass a combination of written and oral comprehensive examinations toward the end of the second year and after completion of the required coursework. Students failing the comprehensive examinations, are given a second chance six months later. A second failure results in termination. Throughout the first two years of required coursework, students whose grade point average falls below a B (3.0) will be placed on academic probation. A student who completes the comprehensive examinations successfully is admitted to candidacy and qualifies for the Ph.D. dissertation proposal defense. Students choose a preceptor to supervise their research during the first year of residence. The preceptor and the student gather an advisory committee which is chaired by a core faculty member of the program, and includes the preceptor and three other members, one from within the program, one from another division within the institution, and one neuroscientist from another institution. The thesis proposal should be in the format of an NIH grant application and will be defended before the advisory committee. The rest of the student's time in residence is spent on the Ph.D. dissertation research. Each student dissertation is evaluated by a neuroscientist from another institution who is an expert in the specific area of research.

Additional policies listed in The Graduate College and the Academic Information sections.

Research Activities

The background and expertise of the faculty cover a broad range of fields within the neurosciences such as behavioral and cognitive neuroscience, neurophysiology, neuroanatomy, neuropsychopharmacology, cell and molecular biology, etc. Research among the faculty is especially strong in the following areas: transplantation and regeneration; the neurobiological bases of normal memory and of its dysfunction; aging; the neurobiological bases of degenerative disorders, such as Alzheimer's disease, and Parkinson's disease and Huntington's disease; movement control; and the pathophysiology of epilepsy and visual physiology. Thus, depending on interest, numerous interdisciplinary research areas are available to the

Division of Pharmacology

Philosophy

The Doctor of Philosophy and Master of Science programs offer training in pharmacology and biomedical research. We believe that a sound training in medical pharmacology and pharmacokinetics should be integral to a pharmacology research degree. All students are initially trained in medical pharmacology and pharmacokinetics. A student then does research in a selected area of the biomedical sciences. During the course of the research, emphasis is placed on developing the student's understanding and communication of research. The ultimate outcome of the research experience is the development of an independent investigator who has the necessary scientific skills and credentials to pursue a career in either an industrial or academic setting. The Master of Science in Clinical Research addresses the need for clinical scientists. The training offered in this program equips clinicians with the necessary skills and knowledge to conduct and assess clinical trials and interventions. This program offers clinicians the opportunity to gain experience in conducting and evaluating clinical trials. The program involves both the Division of Pharmacology and the Department of Preventive Medicine to assure a truly interdisciplinary experience. Clinicians who have completed this program have the expertise to organize, conduct, and evaluate clinical trials. (See Graduate College - Clinical Research Program)

Doctor of Philosophy in Pharmacology

Admission Requirements. Applicants must enter the program in the fall quarter in order to begin the required coursework in the core curriculum. The deadline for submission of applications is generally March 1st. International applications cannot be accepted after March 1st due to the time required to make the necessary visa arrangements. In addition to the basic requirements established by The Graduate College, the division has the following requirements for admission to its program:

- A degree from an accredited college which includes a background in biological, physical, or quantitative sciences,
- Recommended prerequisites include courses in biology, cellular biology, molecular biology, physics, chemistry, organic chemistry, physical chemistry and mathematics, including calculus. Upper-level biochemistry or physiology courses are highly recommended,
- Academic transcripts from all baccalaureate and post-baccalaureate educational experiences. These should provide evidence of excellent academic performance, which will usually be expressed by a minimal grade point average of 3.0 overall and higher in science courses (A = 4.0),
- A clear, concise expression of the applicant's interests and goals,
- Three letters of recommendation from science faculty who can evaluate the character of the applicant.

Applications are evaluated by the division director and the Admissions Committee, whose recommendation is based on several factors. All prior academic experience and the letters of recommendation will be evaluated for an indication of the applicant's potential for success as a graduate student and future independent investigator. The statement by the applicant describing goals and motivation will be studied to determine the compatibility between the applicant's requirements and the capabilities of the graduate program. With rare exceptions, applicants will be required to appear for an interview with faculty members before admission to the program. If accepted to the program, students will receive a stipend and tuition waiver.

Master of Science in Pharmacology

Students in the M.S. thesis program will meet the same set of minimum standards as those described for the Ph.D. It is generally assumed that students entering this program intend to work in industry or want to gain additional training in pharmacology for a variety of purposes. Students in this program are encouraged to visit the Department, although a formal interview is not required. Students entering this program will not be eligible for stipends and must pay tuition. Work study programs are available. The deadline for submission of applications is generally March 1st. International applications cannot be accepted after March 1st due to the time required to make the necessary visa arrangements.

Curriculum

In the first year, the student takes required courses and begins research training. The research project is further developed in the second year and the student completes required courses. The student must pass a comprehensive exam at the end of the second year covering the basic principles of pharmacology. Research is the primary activity of subsequent years, but elective courses are taken to provide the appropriate research tools and to establish a strong base of knowledge in the selected research area.

Courses. The first two years of the program stress instruction in molecular biology, cell biology, and pharmacology. Required courses include the Core Curriculum Series (501-508) and Introduction to Physiology and Pharmacology (PHR 504). In the second year, Medical Pharmacology (PHR 501 and 502) and Pharmacokinetics (PHR 551) are required. A student may also take up to 12 hours of additional elective courses. Additional courses include specialty pharmacology topics (Drugs of Abuse and Addiction, Drug Biotransformation, Pharmacogenetics, or Toxicology), biochemistry, immunology/microbiology and neurobiology. The selection of the elective courses is highly individualized and is based on the research project, student interest, and previous academic accomplishments.

Research. During the first and second years, the student selects a research project in conjunction with a faculty mentor. The student and mentor then select a committee of faculty to guide the student's research activities. This committee approves the proposed research project and determines when the student has completed his/her dissertation. The research project is designed to advance knowledge in a specific discipline and to yield "first author" scientific publications for the student. Research internships at pharmaceutical companies are also available to the students and are designed to enhance the research activities of the student.

Academic Advisor/Principal Advisor. The graduate division director functions as the academic advisor to the student during the first year. The director, during this time, determines the course schedule with the student and monitors the student's progress. Beginning in the first year, the student is expected to gain laboratory experience. This activity is intended to lead to the definition of research interests and to the selection of a principal advisor or mentor from the faculty of the Division of Pharmacology. The advisor then accepts the supervisory role in the development of the student as a scientific investigator.

Qualifying Exams. At the end of the second year, the student will be expected to complete and pass qualifying exams. Written exams will last two full days and cover all aspects of the basic principles of pharmacology through essay questions provided by the faculty. Each exam question will be graded by at least two faculty and reviewed by a faculty committee. Passing the comprehensive exam allows the student to move on to the research phase.

Dissertation Research Committee. The student and mentor select a research committee according to the policies of the Pharmacology graduate program and Rush University. This committee advises the student and evaluates the dissertation and can be constituted at anytime prior to the beginning of the research phase. The committee includes the student's mentor/advisor and one outside faculty member that may be from another Rush department or other institution according to Rush University policy. Additional faculty may be from the Department of Pharmacology at Rush or from Rush faculty members located at pharmaceutical companies. A majority of the members of the five-member committee must be faculty with full-time appointments at Rush. The director of the Pharmacology graduate division, and the chair of the Pharmacology department may serve as ex officio members of the committee. The chair of this committee, who cannot be the student's mentor/advisor, will be chosen at the first committee meeting and will preside at all subsequent meetings and arrange for a timely completion of the dissertation work. The dissertation committee strives for consensus in all its actions. A majority vote of the committee's membership however is sufficient for all activities except the final approval of the dissertation.

Dissertation Proposal and Presentation. The student will propose a series of publication grade research projects. The research projects will include an exhaustive literature review, clear objectives for the project, detailed methods, a critical preview of the potential results, and an evaluation of the potential impact of the project. The proposal will be written and will take the form of an NIH grant application (R-21). The proposal will also be presented to the faculty in a public forum and this will constitute the oral exam. The dissertation proposal must be approved by the student's committee and forms the basis for the student's continued research. The dissertation committee must meet at least twice before the student is considered for graduation. Upon completion of all experiments agreed to by the dissertation committee, the student will present the dissertation to the University in written form (approved by the Director of the Library) and present the work in a public one-hour lecture attended by the dissertation committee and faculty of the University. The dissertation committee then meets in closed session to approve the dissertation. Typically the meeting immediately follows the public lecture. In line with the rules and procedures of The Graduate College, the committee strives for a consensus but the dissertation can be approved over the objections of a single committee member. However, if two committee members disapprove the dissertation, then it is not approved. The awarding of the Ph.D. degree requires the demonstration of a capability for independent research and a contribution to scientific knowledge.

Concurrent M.D./Ph.D. Program

The graduate program in pharmacology will be offered to the student who has been admitted to both the graduate program in the Division of Pharmacology and to Rush Medical College, and who elects to begin both programs of study in the same year. During the first two years, the student will complete the recommended courses in the regular Medical College curriculum for that period of time. The student will then interrupt Rush Medical College enrollment and concentrate full-time on graduate studies in the Division of Pharmacology. When the graduate work is complete, the student will continue with the clerkship program in the Medical College. The student will be strongly encouraged to begin a research program during the summer before coursework begins. Research can be included in the curriculum at any time. After the second year, the student will begin full-time enrollment in The Graduate College, and the clerkship program in Rush Medical College will be delayed until the graduate work is complete. During this time, the student will complete the required coursework, enroll in advanced or elective courses, present and defend a suitable dissertation proposal, complete dissertation research, and present and defend an acceptable dissertation. The Ph.D. degree will be awarded by The Graduate College upon the successful completion of this training program. Students who are admitted to the Division of Pharmacology graduate program and to Rush Medical College, but who do not begin these study programs at the same time, may also benefit from this combined curriculum. An individual study program which includes available aspects of this curriculum can be designed for such students. Students who enter this program are subject to the full conditions and requirements of both colleges.

Master's Degree Programs

Master of Science. The Department accepts students with undergraduate degrees and trains students in basic pharmacology with an emphasis on the development of laboratory skills. Students completing this program proceed to work in laboratories (academic or industrial) or pursue further study in medical school or Ph.D. programs. The admission requirements listed for the Ph.D. program also apply to the master's program. The master's degree training is offered for those who wish to develop their capabilities in a setting of supervised research. The program is open to students just beginning their graduate training as well as senior residents or fellows who wish to enhance their research training. Once the applicant enters the program, a research advisor is assigned and the student begins directed research on an active project, often as an integral member of a team. This is typically a two year program requiring

both coursework and research. During the second year the student will work with the advisor to complete his or her project and identify a thesis committee consisting of three faculty members in the division of Pharmacology or one member from outside the division. The thesis is expected to constitute a major contribution to a publication grade article. The student will participate in a public, one hour thesis defense, followed by committee evaluation to certify that the student has completed all necessary coursework and is prepared to graduate. The thesis must be signed by at least two members of the three member committee. For senior residents or fellows who have completed supporting coursework such as biochemistry, cell biology and statistics, the research experience may only require one year. During the program, the student is critically evaluated for development of skills and understanding related to the research process.

Coursework for M.S. students will be similar to that for the Ph.D. program and will include the Core Curriculum Sequence as well as PHR 501, 502, 504 and 551. In addition, the student must take at least two electives (Drugs of Abuse and Addiction, Drug Biotransformation, Pharmacogenetics, or Toxicology).

Master of Science in Clinical Research. Targeted to clinicians already possessing graduate degrees, this program provides some laboratory skills training with the major emphasis on the organization and evaluation of clinical trials. This program addresses the need for clinical scientists. The training offered in this program will equip clinicians with the necessary skills and knowledge to conduct and assess clinical trials and interventions. This is a post-graduate training program. It is specifically targeted for Doctors of Medicine and Doctors of Pharmacy who wish to add clinical research competencies to their portfolios. Students may also include those with advanced education such as nurses or scientists (See M.S. in Clinical Research for a complete program description).

Professional Master's Program. The Rush Graduate College plans to implement a professional master's degree in Fall 2005. This program will be a 48 hour, non-thesis M.S. program designed specifically to train students for future work in industry. It will last only three quarters. In addition to the core curriculum series, the student will participate in weekly journal club where they will learn to interpret scientific literature. They will also participate in a problem based learning program designed to impart critical thinking skills as they apply to the laboratory environment. The student will also take classes discussing the Regulatory Process and Tools for Research. This later class is designed to teach speaking and presentation skills as well as the other types of activities laboratory managers would be expected to know. The corner stone of this program is intense, three quarter, hands-on, bench work experience. The student will develop a working understanding and be able to perform at least ten widely used techniques that have been developed in conjunction with industry feedback. In addition, the student will take a module in animal surgery. At the end of this laboratory sequence, the student will have a portfolio containing examples of mastered essential laboratory techniques that can be used for the interview process. It is anticipated that the student will be well poised and highly competitive for work in industry.

Academic Policies for all Programs

Students are responsible for satisfactorily completing required courses. Required courses must be taken for a letter grade, and elective courses may be taken for a grade of pass/no-pass. The student must maintain an overall average of B or better. A grade less than B in required courses may also require remediation, depending on the requirements of the program. All no-pass grades require remediation. The student and faculty will develop a remediation plan to ensure that the student develops a mastery of the subject. The remediation plan must be approved by the program's advisory board. Until a grade is remedied, the student is on probation. Failure to remediate a no-pass grade or the receipt of another no-pass grade while on probation will result in termination. The remediation procedures for each program are available from the director.

Student Grievance Procedure*

Numerous checks are in place to assure the fair treatment of students. For example, the comprehensive exams are reviewed by a faculty committee. Likewise, the chair of the advisory committee is intended to be a student advocate who must ensure the timely graduation of the student. In addition, a plan for resolving any grievance involving a graduate student in this division is in place. The written procedures are available in the office of the director.

*Additional policies are listed in The Graduate College and the Academic Information sections.

Division of Physiology

Philosophy

The program of the graduate Division of Physiology provides state-of-the-art training in the most quantitatively-oriented areas of modern physiology and biophysics. To this end, a limited number of students are invited to join particular research laboratories as pre-doctoral fellows, and most of the training occurs in this setting. The sole goal of the faculty is excellence in research, and it expects to develop a nucleus of students who will become future leaders in the field.

Admission

Students who desire to specialize in this program are strongly advised to obtain a broad scientific foundation, including work in the related sciences. Courses in some or all of the following fields are suggested for attainment of this objective: physics, including electronics; chemistry, including physical chemistry; mathematics, including differential equations; molecular and cell biology or cell physiology. An applicant who holds a degree from an accredited institution will be considered for admission on the basis of the following criteria:

- An undergraduate record of superior quality demonstrating proficiency in quantitative science
- A well-organized plan for graduate study and research compatible with expertise in the division
- Recommendations from at least three college faculty members acquainted with the character of the applicant
- Ability to function in a program stressing an independent approach to the acquisition of knowledge
- Other materials required by the division director

The Graduate Record Examination (GRE) is recommended but is not required. Except in unusual cases, the minimum prerequisites for admission will be the attainment by the applicant of a 3.0 overall average (A=4.0) in undergraduate studies with a 3.5 average in science courses, preferably including two years of physics or engineering, inorganic and organic chemistry, physical chemistry, advanced calculus, ordinary differential equations, cell biology or cell physiology. Applicants for admission to the division will be initially evaluated by the division director and advisory committee. Considerations will include overall academic record, evidence of previous ability to pursue successfully independent studies, recommendations of the applicant's undergraduate faculty, and the description of the applicant's scientific research interests. The division director will determine whether additional supporting evidence would aid evaluation of the application and, if so, will make appropriate arrangements with the applicant to submit such evidence.

Applications judged by the division director to demonstrate satisfactory credentials and interests compatible with the research facilities of the faculty will then be evaluated by all faculty members with expertise in the area(s) of interest of the applicant. Considerations in this phase will include not only academic ability but also the resources available to support research in the indicated area. An interview may be requested. Selection of applicants will be by invitation of a faculty member in the division willing and able to serve as the student's principal advisor and research sponsor after endorsement of the selection by the division director, The Graduate College Council, and the dean. In special circumstances, exceptions to this procedure may be made for students with unusual promise but with no firm commitment to a particular area of research. In such cases, the program director will serve as interim principal advisor. Finally, in the case that the division director would be the principal advisor of a student, the physiology department chairperson shall assume the duties of division director with respect to that student.

Curriculum

Courses. Usually prior to starting the program, students will have selected a faculty member as principal advisor. All students admitted to the division will be required to enroll in the medical physiology course as soon as possible after admission and before the dissertation proposal, and obtain an average grade of B or better over all quarters. The student will in the first two years enroll in courses appropriate to the student's research interests as agreed upon in consultation with the principal advisor and the director of the graduate program. It is anticipated that courses deemed essential to the student's graduate training by the division occasionally will not be available in the Division of Physiology or other divisions of The Graduate College. In this case, arrangements will be made for the student to enroll in such courses at other institutions, and performance in these courses will be required to be at the same level as for courses at Rush. In certain circumstances, a program of supervised independent study may be recommended as an alternative to particular coursework. Individual course requirements may be exempted on the basis of a past academic record or by the successful completion of a special examination covering the content of the required course. Such exemptions will not be made automatically solely on the basis of a past academic history but will be judged on an individual basis by the division director and advisory committee. Unless waived, students will enroll in eight credit hours of coursework outside the Division of Physiology.

Course Offerings. The following courses will be available, subject to demand and limitation, to graduate students within The Graduate College:

PHY 451 Physiology I
PHY 452 Physiology II
PHY 502 Introductory Membrane Biophysics
PHY 503 Physiology of Striated Muscle
PHY 504 Neurophysiology

PHY 521 Mathematical Methods for Physiologists
PHY 523 Circuit Theory and Practical Design
PHY 531 Physiological Modeling
PHY 532 Physiological Modeling
PHY 590 Special Topics in Physiology
PHY 598 Introduction to Research
PHY 640 Applied Electrophysiology
PHY 641 Molecular Mech in Control of Ion Permeability
PHY 651 Advanced Topics in Muscle Physiology
PHY 653 Problems in Synaptic Physiology
PHY 655 Sensory Neurophysiology
PHY 690 Research Topics in Physiology
PHY 699 Dissertation Research

Academic Policies*

Dissertation Proposal. Upon admission to the division, the student and his/her principal advisor will begin to make preparations for a proposal upon which the student's original research project will be based. Such preparations will include intensive study of the literature in the student's field of interest, instruction in the basic laboratory skills necessary for professional development in the field, and any other requirements established by the principal advisor and division director in addition to the course requirements discussed above. No later than 36 months after admission, the candidate will present to his/her dissertation committee an original proposal for contribution to knowledge in his/her area of specialization. It will include an extensive review of the relevant scientific literature, a description of the technical aspects of the proposed studies, an outline of the anticipated experimental approach to the major problem of interest, and a discussion of possible results and their interpretation. The student will be expected to defend both his/her proposal and general ability to achieve professional competence before this committee. The dissertation committee will have at least three members: the principal advisor; the division director; and, whenever possible, an individual outside the institution with national stature in the candidate's field of interest, selected jointly by the candidate, principal advisor, and division director. In addition to evaluating the content of the dissertation proposal, the outside member will have a responsibility to maintain close and frequent contact with the student and principal advisor and to advise the division director concerning the progress of the academic program. Ordinarily, the dissertation committee will be constituted as soon as possible after admission of a student to the division. The dissertation proposal may be submitted to the faculty prior to completion of course requirements in order to enable research activity to begin, but the student will not be formally admitted to candidacy until this is satisfactorily completed.

Candidacy. Upon acceptance of the dissertation proposal, the student will be admitted to candidacy for the Ph.D. and will be expected to devote fully his/her energies to the program. All students must meet a minimum residency requirement of one calendar year, following admission to candidacy, unless the division director and dean grant special exceptions. The principal advisor will make frequent reports to the division director concerning the student's progress. Should either faculty member or the candidate feel it appropriate, the dissertation committee can be called into session to judge the student's continued participation in the graduate program or to determine possible alterations in the area of his/her research efforts. In addition, the student and principal advisor will be expected to consult periodically with the other committee members, who may also request the division director to call formal meetings of the dissertation committee. Conflicts between the student and/or any members of the dissertation committee not resolvable by the full committee may be referred to the advisory committee of the division or higher authority as specified in the policies and procedures of The Graduate College. The degree of Doctor of Philosophy is given in recognition of high attainment and ability in a particular field of scientific research as evidenced by submission of a dissertation showing power of independent investigation and forming an actual contribution to existing knowledge. Such dissertation will be submitted to the candidate's dissertation committee for review and defended orally at least three months before the degree is granted. The dissertation committee will ordinarily request an evaluation of the candidate's dissertation by a scientist of national stature not affiliated with Rush University. Acceptance of the dissertation by the dissertation committee will be reviewed by The Graduate College Council and the dean, along with the candidate's entire academic performance in The Graduate College. Determination of completion of all requirements will result in the dean's recommendation that the degree be awarded at the next scheduled commencement exercises of Rush University. Should the candidate not have submitted a dissertation three years after admission to candidacy, the dissertation committee will be convened to evaluate the candidate's progress, and, if proper, to suggest alteration in the program.

Research Activities in the Department of Molecular Biophysics and Physiology

Protein Channels. Protein channels conduct ions through a narrow tunnel of fixed charge, thereby acting as gatekeepers for cells and cell compartments. Hundreds of types of channels are studied every day in thousands of laboratories because of their biological and medical importance: a substantial fraction of all drugs used by physicians act directly or indirectly on channels. Much of the work of Dr. Eisenberg and collaborators concerns open channels because a physical analysis of ion movement in an open channel should be easier than a physical analysis of most protein functions. Open channels have simple structure that does not change on the biological time scale and yet have important biological roles, e.g., in selecting one ion over another. A physical analysis of ion movement in an open channel should be easier than a physical analysis of most protein functions. The function of open channels can be described if the channel protein is described as an invariant arrangement of fixed electrical charges – not as an invariant set of rate constants or an invariant spatial distribution of potential. In that case, Duan Chen and Bob Eisenberg (and colleagues) have shown that the average electric field and current flow can be computed by the Poisson-Nernst-Planck (PNP) equations. The PNP equations describe the flux of ions (each moving randomly in the Langevin trajectories of Brownian motion) in the mean electric field specified in traditional (nonlinear) Gouy-Chapman/Debye-Hückel/Poisson-Boltzmann theories of electrolyte solutions and proteins at equilibrium. We have shown that PNP, in its one-dimensional version, fits a wide range of current voltage (I-V) relations – whether sublinear, linear or superlinear – from 6 types of channels, over ±180 mV of membrane potential, in symmetrical and asymmetrical solutions of 20 mM to 2 M salt. Using a three dimensional version of PNP, several laboratories are able to predict the I-V relations of the channel gramicidin within

some 10 percent over a range of conditions, using the NMR structure, partial charges from standard molecular dynamics programs, and an estimate of the diffusion coefficient of Na+, made from separate data sets, using the one dimensional theory. The anomalous mole fraction (i.e., mixed alkali) effect in K+ channels and L-type calcium channels is easily explained. Single channels of porin and its mutants have been studied at length and our measurements of I-V relations are at least as extensive as measurements from any protein of known structure. Parameter estimates (in the mutants of known structure) are surprisingly close to those predicted (i.e., within 7 percent). Wolfgang Nonner, Dirk Gillespie, and Bob Eisenberg (and colleagues) have studied selectivity, the mechanism by which channels tell one ion from another. The dramatic selectivity of the L-type Ca channel of clinical fame arises naturally if the ions and glutamic oxygens of the selectivity filter of the channel are described as charged spheres, using the Mean Spherical Approximation or other representations of concentrated salt solutions. The fixed charge of the selectivity glutamates forces the channel to hold four positive mobile charges, making a concentration of some 17 molar univalent charge! Four (monovalent) sodium ions occupy twice the volume of two (divalent) calciums; the resulting difference in excluded volume produces calcium selectivity, by changing ion specific entropy and energy, and the overall electrostatic potential. This model predicts many of the selectivity properties of the channel in a wide range of ions and conditions after two adjustable parameters are set to optimal (unchanging) values. Taken together, these results suggest that open ionic channels are natural nanotubes—dominated by the enormous fixed charge lining their walls—in which atomic detail is unexpectedly unimportant because correlation effects are small. Highly charged nonequilibrium systems of this sort are hard to describe by direct simulations of molecular dynamics because those simulations are too small to represent a specific concentration of ions and too brief to compute flux or current. Traditional simulations also have difficulty with the electric field since they use periodic boundary conditions and equilibrium boundary conditions, at best.

Ionic solutions. Dr. Eisenberg's work on ion channels has forced him to think a great deal about the properties of ionic solutions. These it turns out have been mostly studied in the tradition of equilibrium statistical mechanics or by direct simulations with atomic resolution in space and time (i.e., 0.1 Å and 1 femtosecond). Equilibrium analysis cannot predict the large currents that flow through channels. Direct simulations cannot describe systems large enough to have well defined concentrations, particularly of the trace ions and cofactors that control biological function. They cannot last long enough to reach the biological time scale. Zeev Schuss, Boaz Nadler and Bob Eisenberg are trying to develop an analysis of ions in solution based on the properties of their individual ionic trajectories. These can be described by a stochastic differential equation, which, in the ensemble, can satisfy nonequilibrium boundary conditions. The current observed through channel and the properties of ionic solutions arise from these trajectories. Because ions are charge and move rapidly (0.1 psec) in and out of small volumes (active sites of proteins, roughly a sphere of 14 Å diameter), the electrical potential varies a great deal (1 V) in short times and distances. The resulting forces cannot be ignored; indeed, they often dominate. Thus, the stochastic differential equations of motion of ions and water must be coupled to the equations of the electric field if they are to be realistic and Dr. Eisenberg and colleagues are trying to do that in a systematic manner.

Membrane fusion. The goal of the laboratory of Fred Cohen and Grigory Melikyan is to understand membrane fusion. Membrane fusion is a complex protein-mediated process in which a fusion pore – the structure that joins two membranes and establishes continuity between two formerly separate aqueous compartments – forms and enlarges. Fusion between membranes is a key event in diverse cellular processes, including infection of cells. The proteins involved in viral binding and fusion have been unambiguously identified for many viruses.

Influenza virus. More is known about the fusion of influenza virus induced by its envelope protein hemagglutinin (HA) than for any other protein. With Dr. Ruben Markosyan, Drs. Cohen and Melikyan are investigating the biophysical mechanism of fusion. They have shown that fusion occurs by first passing through the state of hemifusion. Hemifusion is a state in which contacting monolayer leaflets of a bilayer membrane merge prior to fusion pore formation. They have also shown that the transmembrane domain of HA is not absolutely required for fusion to occur, but greatly facilitates fusion and pore growth; they have identified and characterized intermediates of fusion and place them in chronological sequence; have showed that spontaneous curvature and other properties of lipids strongly affect pore growth. They are now determining how the approach of transmembrane domains toward fusion peptides induces fusion.

Human Immunodeficiency Virus (HIV). Many viral fusion proteins, including those of influenza, HIV, SIV, Ebola, and respiratory syncytial virus, exhibit great structural similarity, folding into a rod-like structure of six-helix bundles. There is probably some common fusion mechanism conferred by the ability of proteins to fold into six-helix bundles. With Drs. Ruben Markosyan and Levon Abrahamyan, Drs. Melikyan and Cohen are using the fusion protein of HIV, Env, to investigate this mechanism. The bundles are known to be required for fusion to occur. This laboratory has shown that the bundles do not occur in the absence of membrane merger. This means that the bundle does not first form and then cause fusion. Rather a fusion pore is created by the movement of protein as it reconfigures into the six-helix bundle. This laboratory is now investigating whether the continuity of membranes created by formation of a pore allows additional Env to more readily fold into a six-helix bundle and thereby promote pore enlargement. Enlargement is necessary for release of the viral nucleocapsid into cytosol, a vital step in initiating infection.

Membrane rafts. Lipid domains of membranes rich in cholesterol and sphingomyelin are the subject of great interest recently in cell biology because some important integral membrane proteins are preferentially located within them. Such domains are known as "rafts." By studying these domains in model membrane systems, their physical chemistry can be isolated from a multitude of other processes that occur in biological membranes. Dr. Cohen's laboratory is using planar bilayer membranes and wide-field fluorescence microscopy to determine the basic physical-chemical properties of rafts. By using fluorescence probes that mark the rafts, they have shown that rafts are liquid-ordered phases and have characterized some of the viscoelastic properties.

Proton Channels. The properties and biological functions of ion channels are a long-term interest of Dr. Tom DeCoursey's laboratory. For many years potassium selective channels were

studied in lymphocytes, macrophages, and lung epithelial cells. The main focus of the lab is now voltage-gated proton channels. In long collaboration with Dr. Vladimir V. Cherny, the fundamental properties of proton channels have been explored in alveolar epithelial cells. Modulation of the voltage-dependence of the channel by pHo and pHi ensures that it opens only when the electrochemical gradient for H+ is outward. In other words, when proton channels open, they extrude acid from cells, and acid extrusion is the main general function of these channels. A mechanism by which protons regulate the voltage-dependence of channel opening was proposed in collaboration with Vladislav Markin of the University of Texas at Dallas. The regulation of channel opening and closing by pH is hypothesized to occur by modulatory protonation sites, possibly histidine residues at either end of the channel molecule. Studies of the effects of temperature, H+ concentration, and deuterium on proton conduction through the channel suggest that proton channels are not water-filled pores like other ion channels. Instead, protons permeate by a Grotthuss-like mechanism, in which they hop across a hydrogen-bonded network through the channel protein. Dr. DeCoursey's colleagues (including Vladimir Cherny, Tatiana Iastrebova, Deri Morgan, Ricardo Murphy, and Larry L. Thomas from the Department of Immunology/Microbiology) also study proton channels in several types of white blood cells, including human neutrophils, eosinophils, and basophils. Recently, the single-channel conductance was determined in eosinophils in collaboration with Richard Levis (Rush) and Valerij Sokolov (Moscow). The single-channel currents (7-16 fA in amplitude) are 1000 times smaller than "normal" ion channel currents, and are the smallest unitary currents ever measured directly in any channel. In immune cells, the main function of proton channels is not pH regulation, but rather enabling NADPH oxidase to function.

NADPH Oxidase. When immune cells encounter bacteria or parasites, they secrete reactive oxygen species (superoxide, hydrogen peroxide, and bleach) that most consider to be lethal to pathogens. NADPH oxidase is the enzyme that produces these reactive oxygen species. NADPH oxidase is electrogenic because it works by translocating electrons across the cell membrane. Dr. DeCoursey's lab monitors the function of this enzyme in real time in living cells, by recording the electrical signal that it makes. Proton channels in immune cells serve to balance the electron transport by transporting an equal number of protons. This charge compensation is necessary, because electrical depolarization of the membrane potential by itself turns off the enzyme. Inhibiting proton current prevents NADPH oxidase function. Proton transport is measured electrically in the same cells at the same time. The ability to study electron and proton currents simultaneously in living cells as they respond to challenges has been a valuable tool to understand the relationships between these complex molecules. In collaborative studies with Dr. Larry L. Thomas of the Department of Immunology/Microbiology, the relationship between activation of NADPH oxidase and voltage-gated proton channels in phagocytes is under investigation. One useful approach has been use of cells with NADPH oxidase components genetically eliminated ("knockouts") or introduced by transfection. These studies are done in collaboration with Dr. Mary Dinauer of Indianapolis. The lab also studies naturally occurring knockouts, which exist in the leukocytes of patients with the rare hereditary chronic granulomatous disease.

Science Education. Research in the laboratory of Dr. Joel Michael continues to explore the learning and teaching of science (with a focus on physiology) at all post-secondary levels. Work is continuing on a "smart" computer tutor (for cardiovascular physiology) with natural language capabilities in collaboration with Dr. Martha Evens (Illinois Institute of Technology). Two studies are currently underway. One study is examining the learning outcomes that result from use the "smart" computer tutor ("CIRCSIM-Tutor") and comparing these outcomes with the results of using a conventional computer-aided instructional program ("CIRCSIM"). A second study is examining the differences in tutoring behavior of novice and expert tutors with the goal of developing a set of the most effective tutoring rules. A second area of research is focused on the misconceptions that students bring to the classroom and approaches to helping them correct these faulty mental models. This work is being carried out in collaboration with Dr. Harold Modell (Physiology Educational Research Consortium, Seattle, WA) and Dr. Mary Pat Wenderoth (University of Washington). One study is aimed at determining the prevalence of misconceptions about cardiovascular, respiratory and renal physiology and whether some of these misconceptions arise from the students' inability to apply certain simple physical models to physiology. A second study is looking at the effects of different student laboratory protocols on remediating an existing respiratory misconception. Certain simple, easy to implement, changes to conventional laboratory protocols are demonstrating significant improvements in the "success" of these learning experiences.

Cellular signaling and the Regulation of Intracellular Calcium. The newly formed Section of Cellular Signaling is an environment of collaboration comprising laboratories and researchers interested in rapid signals that control metabolic changes within cells. The goals of Drs. Eduardo Rios and Jingsong Zhou's laboratory are to understand mechanisms that generate sudden changes in the concentration of the ion calcium inside cells. These changes control many metabolic responses and functions. Dr. Rios' group is especially interested in these events as they occur in muscles, including skeletal and cardiac muscle. In these tissues, calcium is stored inside the cell in the sarcoplasmic reticulum. Their work has helped determine the molecular makeup of the system that controls release of calcium from the sarcoplasmic reticulum into the cell. In collaboration with Gustavo Brum and Gonzalo Pizarro, of the University of Montevideo, his group has used an "ultrafast" confocal microscope to rapidly image events (Ca sparks) that constitute the minimal units or quanta of calcium release. These images revealed that the source of such sparks, hence the functional units of calcium release, are small groups or clusters of channels, which these researchers have named "couplons." With Michael D. Stern and Heping Cheng, of the National Institute of Aging (Baltimore), Rios has used mathematical modeling techniques, to show that Ca sparks can be reproduced mathematically, assuming that channels within couplons are activated by the increase in cytoplasmic calcium concentration resulting from opening of individual channels within the group. In a collaborative project with Dr. Adom Gonzalez, Assistant Professor of Physiology, and Dr. Isaac Pessah (University of California at Davis), Dr. Rios used specific toxins, of both animal and plant origin. It was shown that these toxins may open one channel within a couplon, and that this opening often results in concerted opening of many other channels within the couplon, to produce a spark. This result confirmed the multi-channel origin of Ca sparks. Drs. Zhou and Rios seek to characterize the molecular interactions between calcium release channels, and dihydropyridine receptors, the voltage sensors of muscle. The studies start

with the introduction of cDNAs of both molecules, in "wild type" form, or after mutations (structural changes), in cells usually devoid of these molecules. Production of these molecules by the foreign DNA helps understand how the changes in structure result in functional changes, hence providing insights to the relation between molecular structure and function. With Dr. Brad Launikonis, Dr. Zhou is investigating the determinants of changes in the release of calcium and frequency of Ca sparks during muscle development.

Viral transduction of foreign DNA into muscle. An interesting recent advance by Dr. Zhou (in collaboration with Dr. Pompeo Volpe, University of Padova, Italy) is the development of techniques to introduce foreign DNA in adult cells of mammals and amphibians (i.e. generation of transgenic cells in living animals) using viral constructs (altered viruses containing the DNA of interest) that are injected into muscles of experimental animals. This technique is currently used to test the effects of overexpression of the calcium-storing protein calsequestrin.

Effects of calcium load on cardiac muscle. Also in the Section of Cellular Signaling, Dr. Thomas R. Shannon uses multiple biochemical and biophysical approaches to study the control of the load of calcium in the storage organelle (the sarcoplasmic reticulum) of normal and abnormal cells of the heart. Dr. Shannon has demonstrated on beating heart cells that the load in the normal sarcoplasmic reticulum is released partially to the cytosol in the process of a heart beat. Quantitative determination of these released fractions will allow him to understand the mutual interactions of Ca load and Ca release, and thus the control of contractile force, an important determinant of cardiac ejection (blood flow) in health and disease. For instance, Dr. Shannon has also demonstrated that the SR Ca load is reduced during heart failure and his research suggests that this reduction may be a critical factor in causing reduced cardiac contraction in this condition. Ongoing experiments are aimed at determining what causes this reduced SR Ca load.

Nonlinear Pattern Analysis. Much of physiological science concerns itself with the detection and analysis of "true signals" from out of the background of "noise." The problem, however, is that 1) some signals often look like noise; or 2) other signals are heavily contaminated by noise. Dr. Joseph Zbilut in collaboration with Dr. Charles Webber, Jr. of Loyola University Medical Center, have been studying techniques that help elucidate these problems. This has evolved into the development of a technique called recurrence quantification analysis (RQA). With the help of Drs. Alessandro Giuliani (Italian Ministry of Health), Alfredo Colosimo and Cesare Manetti (both of the University of Rome "La Sapienza") they have used this technique to gain insights into protein structure/function relationships. RQA has also been useful in understanding other complicated signal systems such as EEGs and ECGs. In collaboration with Dr. Mikhail Zak (Jet Propulsion Laboratory), Dr. Zbilut has developed an analysis of physiological dynamics which are characterized by singularities of equations of motion. Such equations can more realistically model constantly adapting systems-especially neural networks.

Course Descriptions

See also Rush Medical College – Clinical Clerkships following this listing.

Although they usually follow a similar pattern, courses are listed alphabetically by course prefix (not by discipline). Exceptions are MTK-Medical Technology which is located under Clinical Laboratory Sciences and nursing prefixes which are all grouped together.

ANA	Anatomy
BCH	Biochemistry
BHV	Behavioral Science
CDS	Communication Disorders and Sciences
CEL	Cell Biology
CLS	Clinical Laboratory Sciences
MTK	Medical Technology
HCE	Health Care Education
HHV	Health and Human Values
HSM	Health Systems Management
IMM	Immunology
MED	Internal Medicine
MIC	Microbiology
MPH	Medical Physics
NEU	Neurological Sciences
NTR	Clinical Nutrition
NAN	Nursing – Anesthesia
NSG	Nursing – Undergraduate
NUR	Nursing – Graduate
OCC	Occupational Therapy
PCM	Primary Care
PHR	Pharmacology
PHY	Physiology
PPH	Pathophysiology
PRF	Perfusion Technology
PSY	Psychiatry
PTH	Pathology
PVM	Preventive Medicine
VAS	Vascular Ultrasound

Discipline Abbreviations. Courses listed and described in this section have been approved by the several faculties of Rush University. Offerings for the 2004-2005 academic year are listed in the Timetable of Courses published quarterly by the Office of the Registrar. The courses are listed alphabetically according to the discipline to which the course content is most closely related. These disciplines do not necessarily reflect a department in the University or in the Medical Center. A three-character abbreviation for the discipline precedes the course number for each course listed.

Course Numbers. A three-digit course number follows the course abbreviation. It indicates the level of offering for that course as shown below:

Course Level of Offering

300-399	Undergraduate Third Level
400-449	Undergraduate Fourth Level
450-499	Dual Level—may be taken for undergraduate or graduate credit
500-599	Graduate Level
500-549	Master's Level (College of Nursing)
550-599	Doctor of Nursing Level (College of Nursing)
600	Post-Master's Level Residency
601-699	Doctoral Level

Course Content. A course title is followed by a brief description of course content and information pertaining to the course.

Course Prerequisites or Corequistes. Specific prerequisites are noted for some courses. Where no prerequisite is listed, it is assumed that students enrolling will have an adequate background. Students who have any questions about preparation should consult with the instructor of the course. If a corequisite is listed, that course must be taken either during the same term or prior to the course which has a corequisite.

Designated Quarter. Quarter in which course is given. FA (Fall), WI (Winter), SP (Spring), or SU (Summer) are used to designate the quarter in which the course is offered each year.

Course Credit. The number of quarter hours of credit for a course appears between parentheses. In many cases a series of three numbers is shown, e.g. [2-3-3]. The first numbers refer to the hours per week of lecture or seminar; the second, to the number of hours in laboratory or clinical setting; the third, to quarter hours of credit. If any of these is variable, it is replaced with "v".

Clock hours (Rush Medical College). Clock hours appear between brackets. Since students in other colleges may cross-register for courses offered by Rush Medical College, the credit hour value of the course may also appear.

Instructor. When known, the instructor's name is provided. Some programs choose not to list instructor names.

Independent Study Courses. Students may enroll in an independent study course in any discipline of the University under the direction of appropriate faculty with his/her written permission and the approval of the program director. The course number 449 will be used for academic independent study for undergraduates and 599 for independent study for graduate students with the appropriate discipline prefix. Master's candidates in the College of Nursing use NUR 549.

Anatomy

ANA 451 Medical Histology
The microscopic anatomy of cells, tissues, and organ systems of the human body is studied through laboratories, lectures, and self-instructional material. Fine structural specializations relating to tissue function are emphasized along with the histological architecture that characterizes each. FA [3-4-5] [84 hours]

ANA 462 Introduction to Neurobiology
The development, morphology, and functional significance of the human nervous system are presented in lecture and by demonstrations. Fixed human brain preparations and series of neurological slides are used as visual aid materials. Prerequisite: courses in human biology or anatomy and physiology or comparative anatomy, and permission of instructor. [3]

ANA 471 Medical Human Anatomy I
The structure and function of the human body are examined topographically through laboratory dissection, lectures, and preceptorials. Laboratory dissection is conducted regionally, encompassing the thorax, abdomen, pelvis, perineum, head and neck, back, and extremities. Radiological anatomy, living anatomy, and clinical correlations are emphasized. The course also provides a survey of embryology and organ-system development. FA [3-5-6] [98 hours]

ANA 472 Medical Human Anatomy II
Continuation of ANA 471. Embryology is introduced where pertinent. WI [3-5-6] [72 hours]

ANA 505 Embryology
This course focuses on human embryonic and fetal development. Selected readings in developmental biology and genetics will be assigned for discussion purposes. WI [4-0-4]

ANA 511 Graduate Histology
See Histology (ANA 451). This course designation for graduate students includes additional discussion, microscopic slide work, and exam components adapted for graduate study. FA [4-5-7]

ANA 512 Graduate Neurobiology
See Medical Neurobiology (NEU 451). This course designation for graduate students includes discussion and additional readings for graduate students, and exam components adapted for graduate study. [7-3-9]

ANA 513 Graduate Human Anatomy I
See Human Anatomy I (ANA 471). This course designation for graduate students includes additional discussion, dissection, and exam components adapted for graduate study. FA [3-7-8]

ANA 514 Graduate Human Anatomy II
See Human Anatomy II (ANA 472). This course designation for graduate students includes additional discussion, dissection, and exam components adapted for graduate study. WI [3-7-8]

ANA 560 Special Topics in Histology
Introduction to histologic methods and a survey of histology and cell biology of selected organ systems tailored to students' interests. Prerequisite: permission of instructor. [v-v-v]

ANA 581 Research Methods in Anatomy
Discussion, demonstrations, and directed laboratory work provide exposure to general histological techniques as well as introduction to selected methods adopted by the student's research advisor. Consult program director. [2-4-4]

ANA 590 Special Topics in Anatomy
Exploration of literature dealing with cell and molecular mechanisms and topics related to ongoing research in the department. A paper is generally required that can serve as the basis for background literature review for development of thesis/dissertation documents. Consult program director. [v-v-v]

ANA 591 Teaching Assistantship
Provides a directed experience in instruction and presentation techniques. Prerequisite: Consult program director. [1-4-3]

ANA 595 Journal Club
[1-0-1]

ANA 598 Master's Thesis Research
Laboratory research project and preparation of the master's thesis. A letter grade is provided for this course. [v]

ANA 599 Independent Study [v]

ANA 600 Thesis/Dissertation Supervision
Supervision while student is writing the master's thesis or doctoral dissertation following all required course work. Repeated until thesis/dissertation has been accepted for presentation/defense. Student pays enrollment fee. No credit.

ANA 601 Surgical Anatomy
A short-term laboratory program for medical students of regional dissections, demonstrations, or special dissections oriented to clinical and surgical aspects of anatomy. Prerequisite: ANA 471-2 or equivalent and permission of instructor. [0-v-v]

ANA 602 Advanced Anatomy
An independent laboratory-based microscopic or dissection opportunity for graduate students. Prerequisites: ANA 501, or 503, 504, or equivalent, and permission of program director. [0-v-v]

ANA 603 Advanced Histology/Cell Biology
A short-term practicum for medical students on selected organ systems. Prerequisite: ANA 451 or equivalent. [0-v-v]

ANA 699 Research
Research devoted to the preparation of a dissertation in partial fulfillment of the requirements of the degree program. Prerequisite: permission of program director. This is a P-F course. FA WI SP SU [0-v-v]

Biochemistry

BCH 470 Introduction to Biochemistry

BCH 471 Medical Biochemistry I
Biochemistry of biologically important compounds and molecular biology. WI [5] [54]

BCH 472 Medical Biochemistry II
Metabolism and nutrition. SP [5] [54]

BCH 505 Advanced Biochemistry
Continuation of BCH 471, and 472 at the graduate level. Special emphasis is given to protein biochemistry, enzymology and molecular biology. SP [4]

BCH 531 Cell Biology I
Cell structure and molecular organization of organelles; cell signaling, adhesion and vesicular traffic. WI [3-0-3]

BCH 532 Cell Biology II
Molecular interactions of cells within specialized tissues during development, normal and disease states. SP [3]

BCH 571, 572 Medical Biochemistry I, II
Same as BCH 471, 472 designed for graduate students in The Graduate College. [5] [5]

BCH 581 Biochemical Research Techniques
FA [4]

BCH 582 Biochemical Methodology
Continuation of BCH 581. WI [4]

BCH 583 Scientific Writing
Writing of a scientific abstract and a grant application on work performed in BCH 532. [2]

BCH 585 Extramural Research
An 8-10 week [usually spring quarter] experience at an industrial research laboratory in Europe or the U.S. Student will focus on major and minor research areas. Assigned reading, a final examination and a written report are required. SP [5]

BCH 595 Journal Club
Discussion of current journal articles. FA WI SP [2]

BCH 597 Seminar
FA WI SP [1]

BCH 599 Independent Study
[V]

BCH 624 Connective Tissue Biochemistry
FA [3]

BCH 651 Science and the Law
Substantive law in the areas of products liability, professional malpractice, food and drug law, patents, forensics, evidence and other areas. SU or FA [2]

BCH 690 Minicourses
[1]

BCH 698 Introduction to Research
FA WI [2]

BCH 699 Research in Biochemistry
[v]

Behavioral Sciences

BHV 511 Wholistic Health: Use of Self
The overall theme of the integration seminars is the importance of and commitment to a clinical approach to comprehensive mind, body and spiritual health care. The emphasis of this multidisciplinary seminar is spiritual assessment of self, individuals and families. Self as therapeutic agent/health minister also is emphasized. [3]

BHV 512 Wholistic Health: Working with Faith Communities
The overall theme of the integration seminars is the importance of and commitment to a clinical approach to comprehensive mind, body and spiritual health care. The emphasis of this multidisciplinary seminar is community and congregational life. Faith communities and their role in health and healing will be explored and developed, as will the provider's role within the health and ministry team. [3]

BHV 513 Wholistic Health: Impact of Faith on Community Systems
Overall theme of integration seminars is the importance of and commitment to a clinical approach to comprehensive mind, body and spiritual health care. Emphasis of this multidisciplinary seminar is integration of health and faith through knowledge of influence on community systems to accomplish planned change. Through examples of coalition building, negotiation processes, community development, advocacy/community validation, students study local, regional, national and/or international programs which have emerged through faith action to shape health care services. [3]

BHV 522 Child/Family Development Throughout the Life Span
The development and evolution of families throughout the life cycle is presented. Research methods used to study family process are discussed. Prerequisite: NUR 521. [3]

BHV 528 Major Psychopathological Disorders: Theory, Treatment and Research
Major forms of mental illness and the management of behaviors related to mental illness is studied. [3]

BHV 553 The Older Adult
This course considers the changing age demographics, the multiple theoretical perspectives of old age, as well as some of the major problems and issues confronting aged persons and society. Also, the impact of an aging society on social policy is addressed. [3]

Communication Disorders and Sciences

CDS 501 Audiologic Methods for Speech-Language Pathologists
This course introduces methods for basic audiologic assessment of adults and children for use by speech-language pathologists. FA [1-0-1]

CDS 504 Speech Science
Students study the physiology of speech production, the acoustic characteristics of speech, and processes by which listeners perceive speech. The dialectal and/or cultural characteristics of normal speech and the acoustic and perceptual characteristics of abnormal speech are also addressed. Includes lectures, class discussions, and laboratory work. FA [4-0-4]

CDS 507 Neurological Bases of Speech, Hearing, and Language
Central and peripheral nervous system structures which form the neurologic bases for speech, hearing and language are presented. FA [3-0-3]

CDS 509 Clinical Observation in Audiology
In this course, students observe diagnostic and rehabilitative audiologic processes with infants, children and adults in out-patient, in-patient and short term care settings. Students also observe speech and language diagnostic treatment sessions with children and adults. FA [1]

CDS 510A Professional Issues for Speech-Language Pathology
This course provides an introduction to professional issues for speech-language pathologists. Topics include professional ethics, multi-cultural issues, team building, reimbursements, risk management, prevention, sexual harassment and other professional areas. FA [3-0-3]

CDS 511,512,513,514,515 Speech-Language Pathology Practicum I - V
Supervised clinical experience with patients presenting speech, language, voice, fluency, or swallowing impairments. Students develop evaluative, therapeutic, counseling, and report-writing skills. Relationship of speech-language pathology to other health care professions is examined. Experience includes patients from diverse cultural backgrounds. [v-v-v]

CDS 516,517,518,519,520 Audiology Practicum I - V
Supervised clinical experience with patients displaying various hearing impairments. Students develop skills in diagnostic evaluation, obtaining case histories, counseling, and treatment techniques for pediatric through geriatric patients. The relationship of audiology to other health care professions is examined. The practicum experience includes patients from diverse cultural backgrounds. [v-v-v]

CDS 521 Language Disorders in Preschool Children
Normal acquisition and disordered language in the preschool child are presented, including theory, assessment and models of intervention. Language analysis procedures are given consideration. SP [3-0-3]

CDS 522A Language Disorders in School Age Children
Language learning, disordered language, and the impacts they have on academics are discussed. Literacy development is considered. Language learning disabilities with regard to assessment and treatment are reviewed. FA [3-0-3]

CDS 523 Sign Language
This introduction is designed to develop sign language skills to a beginning level for both expressive and receptive vocabulary. SU [2-0-2]

CDS 524 Fluency, Dysfluency, and Stuttering
Child and adult fluency disorders will be studied. Students learn to describe pertinent characteristics of speech fluency, identify the presence of a clinically significant fluency problem, and determine etiologic and maintaining factors. Appropriate management strategies are also considered. WI [3-0-3]

CDS 528 Audiologic Assessment
This course presents behavioral tests of the auditory system that provide a differential diagnosis of auditory function. This course is taken in conjunction with CDS 529 Clinical Methods in Audiology. WI [4-0-4]

CDS 529 Clinical Methods in Audiology
This course presents implementation of clinical audiologic assessment procedures. This course is taken in conjunction with CDS 528 Audiologic Assessment. WI [1-0-1]

CDS 531 Amplification I
This course provides a brief history of amplification as well as a discussion of the variety of hearing aids available. Topics include theory and practical applications in earmold acoustics, design, and modifications; selection techniques; real ear methods; electroacoustic analysis; and fitting and verification procedures. Students will complete earmold impressions and modifications, probe microphone measurements, electroacoustic analyses, and hearing aid troubleshooting. WI [3-0-3]

CDS 532 Amplification II
This course expands upon basic amplification technology and hearing aid fitting techniques presented in Amplification I. Emphasis is on advanced concepts and practices as well as current research and trends. SP [5-0-5]

CDS 533 Adult Rehabilitative Audiology
Examination of adult aural rehabilitation. Visual, auditory, and bi-sensory stimuli in communication are considered along with assessing communicative function, auditory training, speechreading, amplification, assistive listening devices, cochlear implants and the psychosocial aspects of hearing impairment. Geriatric population and working-age adult will be considered as separate rehabilitative challenges. SP [4-0-4]

CDS 534 Pediatric Rehabilitative Audiology
An examination of the strategies involved in the management of hearing impaired and deaf children. Topics discussed include parent counseling, auditory training, speech and language training and educational opportunities. Various educational models will be covered. The audiologist's role in case management will be discussed. SU [2]

CDS 535 Anatomy and Physiology of Hearing and Speech
This course includes anatomy/physiology of the outer, middle and inner ear and central auditory pathways. Anatomy and physiology of the vestibular system and theories of hearing are included. An overview of the anatomy and physiology of structures related to speech production is presented. FA [4]

CDS 536 Auditory System Anatomy Laboratory
This laboratory course examines the structures important for hearing through various activities which may include cadavers, models, specimens, computer images, and slides. This course is taken in conjunction with CDS 535 Anatomy and Physiology of Hearing and Speech. FA [1]

CDS 537 Anatomy and Physiology of the Speech System
This course includes embryologic development system of the speech mechanism as well as anatomy and physiology of systems for respiration, phonation, and articulation. FA [3-0-3]

CDS 538 Speech System Anatomy Laboratory
This laboratory course examines the structures important for speech through various activities which may include cadavers, models, specimens, computer images, and slides. The course is taken in conjunction with CDS 537 Anatomy and Physiology of the Speech System. FA [1]

CDS 540 Management of the Head and Neck Cancer Patient: Speech-Language Pathology Evaluation and Intervention
The course studies the assessment and management of voice, speech, and swallowing disorders following head and neck cancer surgery. Evaluation and treatment of patients following oral and laryngeal surgeries as well as patients who require tracheotomies with or without ventilator dependency will be discussed. Swallowing, voice and other speech disorders will be covered. SP [3-0-3]

CDS 543 Electrophysiologic Assessment of the Auditory System
Course introduces principles/practices of electrophysiologic methods in audiologic assessment. Special emphasis on the auditory brain-stem response and its use with both pediatric and adult patients. Course also includes basic information on electrocochleography and otoacoustic emissions. SP [3-v-4]

CDS 544 Pediatric Audiology
Course examines the normal development of auditory behaviors and impact of hearing loss on speech/language development. Emphasis is on the evaluation and management of children with hearing loss. SP [3-0-3]

CDS 546 Vestibular Assessment and Rehabilitation
Anatomy and physiology of the vestibular and ocular motor systems will be reviewed. Disorders of patients presenting vertiginous symptoms will be discussed with emphasis on technique and interpretation of ENG findings. Acceleration measurements will be introduced. FA [4]

CDS 547 Vestibular Lab
Taken in conjunction with CDS 546. Students develop basic skills in the practical application of ENG and vestibular rehab. FA [1]

CDS 548 Advanced Electrophysiologic Assessment
Students learn about the background, anatomy and physiology, and clinical applications of advanced auditory electrophysiologic procedures including specialized ABR procedures, ASSR, electrocochleography, middle latency response, P300, MMN, visual and somatosensory responses, intraoperative monitoring and otoacoustic emissions. Current issues and advanced applications are considered. WI [4]

CDS 554 Instrumentation in Audiology
This course will provide an introduction to instrumentation used in the measurement of hearing processes. Basics of electricity and electronic components are introduced. Personal computers and their interfacing with audiologic equipment are examined. Calibration and record keeping requirements will be examined for basic and advanced instrumentation used in audiology. WI [2]

CDS 558 Dysphagia
This course includes a review of normal anatomy and physiology of deglutition. Topics include pre-swallow assessment, as well as non-instrumental and instrumental examinations with emphasis on videofluoroscopic swallow study procedure and analysis. Advanced diagnostic and therapeutic techniques that are related to specific swallowing disorders are emphasized. Special populations including pediatrics, geriatrics, and patients with degenerative neurological conditions are discussed. Diagnosis, clinical decision making and follow-up procedures are included. WI [3-0-3]

CDS 560 Seminar in Phonological Disorders
Normal and Abnormal aspects of phonological development are the focus. Theory, assessment and intervention for articulation/phonological disorders are discussed. Phonetic transcription is reviewed. Consideration of cross-cultural factors on phonology is given. WI [4]

CDS 562 Craniofacial Anomalies
An overview of the natural history of cleft palate and other craniofacial anomalies characterized by specific speech problems. The emphasis will be on the development of the multidisciplinary team, speech disorders secondary to these craniofacial anomalies, history of previous care and treatment of persons with these disorders, update on recent research, new treatment developments, and approaches to diagnostic and therapeutic speech intervention. Observation of diagnostic evaluations and treatment planning by a multidisciplinary craniofacial team is included as part of the curriculum. SU [3-0-3]

CDS 563 Voice Disorders
This course reviews the anatomy, neuroanatomy, and physiology of normal voice production and examines the acoustics and perceptual dimensions of normal and abnormal voice. Predisposing, precipitating, and perpetuating etiologic factors are considered. Skills for assessment, differential diagnosis and management of hyperfunctional, psychogenic and organic voice disorders are developed. SP [3-0-3]

CDS 564 Aphasia
Adult onset neurogenic language disorders are examined. Emphasis on pathophysiology, symptomatology, assessment, diagnosis, treatment, and the role of counseling. Theoretical models and past/current controversies included. WI [4-0-4]

CDS 566 Pathophysiology of the Auditory System
This course will examine various ear diseases and other pathologies as they affect the auditory system. SU [3-0-3]

CDS 567 Dysarthria
This course will focus on the diagnosis and treatment of a group of speech disorders that affect either a single or a combination of the speech subsystems of respiration, phonation, resonance, articulation and prosody. The speech disorders are caused by changes in speech musculature or its movement patterns due to central or peripheral nervous system damage. This course includes lectures, class discussions, laboratory work and hands-on class projects. SU [4-0-4]

CDS 568A Cognition and Communication Disorders
This course discusses normal cognition and effects of dementia, agnosia, injury to the non-dominant cerebral hemisphere, and traumatic brain injury on communication. Assessment and management of communication disorders arising from these conditions are reviewed. FA [3-0-3]

CDS 571 Speech and Language Development and Disorders
Normal speech and language development from birth through adulthood will be presented. An introduction to the broad spectrum of pediatric speech and language disorders will be included. WI [3-0-3]

CDS 575 Issues in Counseling
The major focus is on understanding the process of the helping relationship. Students will consider the impact of cultural and age-related issues, and they will develop skills and competencies needed to influence effectiveness as a communicator. Knowledge of selected counseling theory as it integrates into practice will be acquired. WI [3-0-3]

CDS 581 Research Methods in Communication Disorders
The development of skills in understanding and critiquing research reports is emphasized. Principles and criteria for evaluating research, including statistical analyses and issues of validity are studied. Consideration is given to both group and single subject research designs. WI [3-0-3]

CDS 589 Research Practicum
Development of practical research skill through involvement in research project. Research methods such as data collection and analysis, and report writing are emphasized. FA [v-v-v]

CDS 590 External Practicum in Speech Pathology
Students are placed at external practicum sites at Rush network hospitals and/or other cooperating institutions. [v-v-v]

CDS 591 Applied Topics in Communication Disorders and Sciences I
Scientific, clinical, and professional issues in audiology and speech-language pathology are examined using a variety of teaching formats that include guest speakers in student development sessions, clinical rounds, and journal club. Development of analytic and clinical problem solving skills is emphasized. This course meets weekly during regular sessions of the Fall, Winter, and Spring quarters. Students register in Fall. The grade and credit is given at the completion of Spring quarter. P/NP grading. FA, WI, SP [1]

CDS 592 Applied Topics in Communication Disorders and Sciences II
Continuation of CDS 591. Second- and third-year students register in the Fall.[1]

CDS 598 Thesis
Under the guidance and direction of a faculty member and committee, the student originates, proposes, and executes an experiment. These projects must reflect a high degree of scholarship. [v-v-v]

CDS 599 Independent Study
Students pursue in depth an area of their choosing under the direction of a faculty member. [v-v-v]

CDS 603 Acoustics and Psychoacoustics
This course includes the basic principles underlying the acoustics, analysis, and perception of sound. Psychoacoustic principles, theories of hearing and their relationship to normal hearing are presented. FA [4]

CDS 604 Acoustic Phonetics and Speech Perception
The process of speech perception, theories of speech development, and speech perception of both the pediatric and elderly populations are included in this course. Phonetics and phonetic transcription are introduced. SP [2]

CDS 605 Embryology and Genetics of the Auditory System
This course introduces basic principles of genetics as well as auditory, vestibular, and craniofacial embryology. Congenital [genetic and multifactoral] auditory disorders will be discussed, including the spectrum of hereditary syndromes common to individuals with hearing loss. Strategies for referral to genetic counselors and other health care professionals will be included. Discussion of the Human Genome Project and current developments will be included. SP [3]

CDS 608 Pharmacology
The general principles of drug action related to communicative function will be presented. Emphasis will be on activity, mode of action, side effects, toxicity and drug interactions relevant to the practice of audiology. FA [2]

CDS 610 Professional Issues in Audiology
Like other professions, the ethical and professional practice of audiology involves a number of specialty and legal matters. Licensure and credentialing, professional standards, multicultural issues, lifelong learning, mentoring, harassment, reimbursement, coding, third party payment, government regulations, legislation and advocacy are among the issues discussed in this course. SU [3]

CDS 612 Practice Management
Various service delivery models and their characteristics are introduced in this course. Parameters associated with practice management include business plan development, private practice orientation, trends in healthcare, marketing, cost/benefit ratios, financial and accounting considerations and personnel issues. FA [2]

CDS 616, 617, 618 Clerkship I, II, III
This clerkship sequence is a three-quarter sequence of supervised audiologic patient care in a variety of sites on and off-campus. Student assumes increasing responsibility for the full range of basic and intermediate level audiologic diagnostic and rehabilitative procedures. SP, SU, FA [4][4][4]

CDS 619, 620 Internship I, II
This internship sequence is a two-quarter sequence of advanced audiologic patient care in an off-campus placement. Student assumes caseload management under supervision. The internship experience includes patients from across the lifespan and from diverse cultural backgrounds. WI, SP [5][5]

CDS 626 Hearing Conservation
This course includes an introduction to the effects of noise on hearing, sound measurement, noise descriptors, testing and follow-up. Prevention, hearing conservation procedures and devices are presented. Federal, state and local regulations, workmens'compensation and litigation are also discussed. FA [3]

CDS 631 Auditory Processing
This course includes neuroanatomy and neurophysiology of central auditory processing as well as differential diagnosis, classification of disorders, and management of processing disorders in children, adults and the elderly. SU [2]

CDS 633 Geriatric Audiology
This course provides an overview of gerontology with an emphasis on differentiation between the normal aging process and pathological changes. Effective treatment planning and management of the elderly individual with hearing loss are presented. Multicultural aspects of aging are addressed. SP [2]

CDS 635 Cochlear Implants
This course focuses on the cochlear implantation process from candidate selection and the pre-implant work-up through post-implant rehabilitation of both children and adults. Speech coding strategies, programming and current trends will be included. SU [2-0-2]

CDS 636 Educational Audiology
The practice of audiology in the school setting involves special issue and considerations. This introductory course includes topics that range from identification and assessment practices to case management, IEP/IFP teams, program development, and federal legislation. SP [3-0-3]

CDS 659 Seminar in Ethics
Students will learn to delineate ethical foundations and commitments in audiology and allied health and to identify, analyze, and resolve ethics problems in these fields. They will learn to apply such tools as identification of their own values, professional codes of ethics, ethical theories and principles, a model for examining the ethics of specific cases, attention to the suffering of the clinician, and organizational ethics. Course will be taught through lecture, reading, discussion, and web events. [2]

CDS 660 Seminar in Leadership
In this on-line seminar, students will learn to understand and develop their own leadership skills. The course engages students in explorations of leadership. Students will analyze selected leadership literature and will examine the work of leaders in audiology, industry, and other areas. SU [1]

CDS 661 Seminar in Amplification
This seminar focuses on current technological, fitting and rehabilitation issues related to personal amplification systems. Taught by a visiting professor, prominent in the area of amplification.FA [1]

CDS 681 Investigative Project
In this directed course, the student will select and analyze a specific clinical, research or professional problem. Completion of the project includes a professional paper and tutorial presentation. Repeatable course. [3]

CDS 691, 692, 693, 694 Externship I, II, III, IV
This externship sequence is a full-time advanced audiologic clinical placement under the direction of a faculty member or preceptor. Externship is usually off-campus and emphasizes independent clinical practice as well as participation in clinical operations, and administrative and professional activities. [8 each quarter]

Cell Biology

CEL 501 Introduction to Cell Biology
Biochemical, morphological and physiological aspects of cells will be discussed. Approaches utilized to study cells, including recombinant DNA technology, will be introduced. Prerequisite: PHY 551, 552 or instructor approval. [2-0-2]

Clinical Laboratory Sciences

A graduate course listed with the equivalent undergraduate course requires additional competencies to meet graduate level credit.

CLS 300/500 Laboratory Fundamentals
Comprehensive instruction in laboratory safety emphasizing fire, electrical, chemical and biological hazards. Other topics include basic laboratory mathematics and medical terminology. [2-0-2]

CLS 302/502 Clinical Chemistry I

Biochemistry, analysis and application of clinically significant chemical substances. Theory, maintenance and operation of basic equipment such as pipeting devices, balances, centrifuges, spectrophotometers and electrophoretic cells. Introduction to quality control and correlation of data for selected disease states. Covers proteins, carbohydrates and enzymes. [3-6-5]

CLS 303/503 Clinical Chemistry II
Biochemistry, analysis and application of clinically significant chemical substances. Second in a series of three courses. Theory of ion selective electrodes, immunoassay analysis, routine chemistry and immunoassay automation platforms. Covers lipids, non-protein nitrogens, hemoglobin degradation products, electrolytes, pH and blood gases. Includes correlation of data for selected disease states. Prerequisite CLS 302/502 [3-0-3]

CLS 304/504 Clinical Chemistry III
Biochemistry, analysis and application of clinically significant chemical substances. Third in a series of three courses. Theory of chromatography and atomic absorption spectrophotometry. Covers therapeutic drug analysis, trace metals, endocrinology, vitamins, toxicology, fetal/maternal testing and current trends. Includes correlation of data for selected disease states. Prerequisite CLS 303/503 [3-0-3]

CLS 311/511 Hematology I
Study of normal hematopoiesis including development, metabolism, kinetics, and function of red cells, white cells, and platelets and an introduction to the various associated hematologic disorders. Includes laboratory experiences dealing with basic routine tests performed in a clinical hematology laboratory, such as simple automated cell counting, blood smear morphology, and reticulocyte counts. Departmental permission required. [v-v-v]

CLS 312/512 Body Fluid Analysis
Analysis of various body fluids with emphasis on the theory and practice of clinical procedures. Component topics will include the analyses of urine, gastric juice, cerebral spinal fluid, feces, semen, transudates, and exudates. Departmental permission required. [v-v-v]

CLS 317/517 Hemostasis
Study of normal and abnormal hemostatis. Fundamentals of hemostasis, including coagulation pathways and laboratory procedures, which evaluate these mechanisms, are covered. Departmental permission required. [v-v-v]

CLS 319/519 Serology
Students will become familiar with the purpose, principles, performance and interpretation of various diagnostic tests used in the clinical laboratory to evaluate the immune system, and antibody-antigen reactions in vitro. Specific topics include testing for syphilis, antinuclear antibodies, rheumatoid factor, mononucleosis, etc. Departmental permission required. [v-v-v]

CLS 321/521 Microbiology
This course focuses on the diagnostic procedures employed in the clinical bacteriology laboratory, such as specimen collection and the isolation and identification of medically important bacteria. Mechanisms of antimicrobial activity and antibiotic susceptibility testing are discussed. Laboratory activities familiarize the student with the colony morphology of clinically important bacteria and consist of learning procedures used in the identification of bacteria isolates, including the gram stain and various biochemical assays. These activities are then applied to the identification of unknown bacterial isolates found in patient specimens. Departmental permission required. [v-v-v]

CLS 322/522 Parasitology, Mycology and Virology
This course provides clinical background in mycology, parasitology, and virology. Emphasis is on the disease involved and on diagnostic procedures used in the laboratory. The laboratory portion consists of identification, specimen collection and processing of medically important viruses, fungi and parasites. Departmental permission required. [v-v-v]

CLS 327/527 Advanced Hemostasis
This course consists of a review of coagulation concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical coagulation, including evaluation of intrinsic and extrinsic pathway disorders, hereditary coagulopathies, and diagnostic tests performed in the clinical coagulation laboratory. Departmental permission required. [2]

CLS 329/529 Advanced Serology
This course consists of a review of clinical serology concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical laboratory including of various serological tests used routinely in the clinical laboratory for the diagnosis of syphilis and other infectious diseases, as well as, autoimmune diseases such as rheumatoid arthritis and thyroiditis. Departmental permission required. [2]

CLS 331/531 Clinical Immunology
An introduction to the basic concepts and terminology of immunity including development, structure and function of the lymphoid systems; the basis of antigenicity; antibody structure; methods of detection and measurement; mechanism of cellular immunity; white cell function; hypersensitivity reactions; the complement system; and mechanisms of immune suppression and tolerance. Departmental permission required. [v-v-v]

CLS 332/532 Clinical Immunohematology
Blood group antigens and antibodies from the discoveries of Landsteiner in 1900 to the present day are studied. Blood banking procedures involved in drawing, testing, storing, and transfusing whole blood and its components are discussed. The laboratory section will deal with the basic blood bank procedures including ABO grouping, RH typing, compatibility testing and special antibody studies. Departmental permission required. [v-v-v]

CLS 370/570 Advanced Laboratory Fundamentals
This course consists of a review of mathematical and laboratory techniques followed by a comprehensive evaluation and additional advanced theory and practice. An online medical vocabulary competency is included. Departmental permission required. [2]

CLS 371/571 Advanced Hematology
This course consists of a review of hematologic concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical hematology including hematopoiesis; development; metabolism; kinetics; function of red cells, white cells, and platelets; and associated hematologic disorders. Includes laboratory experiences dealing with diagnostic tests performed in a clinical hematology laboratory, advanced white and red cell morphology and other specialized diagnostic tests. Departmental permission required. [v-v-v] [3-5]

CLS 372/572 Advanced Body Fluid Analysis
This course consists of a review of concepts in urinalysis and body fluid analysis followed by a comprehensive evaluation and additional advanced theory and practice in the clinical laboratory. Component topics will include the analyses of urine, cerebral spinal fluid, feces, semen, transudates, and exudates. Departmental permission required. [Variable: 2-4]

CLS 373/573 Advanced Clinical Chemistry I
This course consists of a review of clinical chemistry concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical chemistry. Component topics include analysis and application of clinically significant chemical substances. Theory, maintenance and operation of equipment such as pipetting devices, balances, centrifuges, spectrophotometers and electrophoretic cells. Quality control and correlation of data for selected disease states is presented. Covers proteins, carbohydrates and enzymes. [Variable: 3-5]

CLS 374/574 Advanced Clinical Chemistry II
This course consists of a review of clinical chemistry concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical chemistry. Second in a series of three courses. Theory of ion selective electrodes, immunoassay analysis, chemistry and immunoassay automation platforms. Covers lipids, nonprotein nitrogens, hemoglobin degradation products, electrolytes, pH and blood gases. Includes correlation of data for selected disease states. Departmental permission required. [3]

CLS 375/575 Advanced Clinical Chemistry III
This course consists of a review of clinical chemistry concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical chemistry. Biochemistry, analysis and application of clinically significant chemical substances. Third in a series of three courses. Theory of chromatography and atomic absorption spectrophotometry. Covers therapeutic drug analysis, trace metals, endocrinology, vitamins, toxicology, fetal/maternal testing and current trends. Includes correlation of data for selected disease states. Departmental permission required. [3]

CLS 376/576 Advanced Microbiology
This course consists of a review of clinical microbiology concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical microbiology including diagnostic procedures employed in the clinical bacteriology laboratory, such as specimen collection and the isolation and identification of medically important bacteria. Mechanisms of antimicrobial activity and antibiotic susceptibility testing are discussed. Includes laboratory experiences dealing with diagnostic tests performed in a clinical activities familiarize the student with the colony morphology of clinically important bacteria and consist of learning procedures used in the identification of bacteria isolates, including the gram stain and various biochemical assays. Departmental permission required. [Variable: 3-5]

CLS 377/577 Advanced Parasitology, Mycology and Virology
This course consists of a review of clinical concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical mycology, parasitology, and virology. Emphasis is on the disease involved and on diagnostic procedures used in the laboratory. Includes laboratory experiences dealing with diagnostic tests and identification, specimen collection and processing of medically important viruses, fungi and parasites. Departmental permission required. [Variable: 3-5]

CLS 378/578 Advanced Immunology
This course consists of a review of clinical immunology concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical immunology including terminology of immunity including development, structure and function of the lymphoid systems; the basis of antigenicity; antibody structure; methods of detection and measurement; mechanism of cellular immunity; white cell function; hypersensitivity reactions; the complement system; and mechanisms of immune suppression and tolerance. [3]

CLS 379/579 Advanced Immunohematology
This course consists of a review of clinical immunohematology concepts followed by a comprehensive evaluation and additional advanced theory and practice in clinical immunohematology including, blood group antigens and antibodies from the discoveries of Landsteiner in 1900 to the present day. Blood banking procedures involved in drawing, testing, storing, and transfusing whole blood and its components are discussed. Includes laboratory experiences dealing with blood bank procedures including ABO grouping. RH typing, compatibility testing and special antibody studies. Departmental permission required. [Variable: 3-5]

CLS 405/505 Quality Issues for CLS
This course presents the methods and strategies used to ensure quality testing in all types of settings including centralized laboratories, point of care (POC) settings, physicians' office laboratories, in-home testing and direct access testing. Topics include quality assurance, competency testing, proficiency testing, method evaluation, reference values, and predictive value statistics. Common POC testing devices and kits will be demonstrated. Students will be required to demonstrate competency performing bedside testing. Prerequisite CLS 304/504 [3-0-3]

CLS 406/506 Laboratory Information and Automation Systems
An overview of health informatics, the computerized patient record and information systems that interface with clinical laboratory systems. Emphasis will be on laboratory information and automation systems including system selection, installation, validation, maintenance, connectivity, E-laboratories and future trends. Prerequisite CLS 405/505 [3-0-3]

CLS 410/510 Special Topics
An examination of contemporary professional issues in clinical laboratory sciences. Content varies according to topics chosen by instructor. [v-v-v]

CLS 413/513 Hematology II: Case Studies
Review of erythrocyte, leukocyte, and coagulation disorders through the use of case studies. Critical thinking is used to analyze patient histories, clinical symptoms, and significant laboratory findings. Prerequisite: CLS 311 or 511. [2-0-2]

CLS 441/541 Molecular Techniques
The molecular biology course consists of an introduction to the principles, methodologies and applications of molecular biological procedures used in the clinical laboratories. Emphasis is placed on the molecular biological procedures used in the identification of infectious agents that cause human disease. Departmental permission required. [v-v-v]

CLS 442/542 Infectious Disease Case Studies
This course will provide the student with the opportunity to analyze patient laboratory information in order to diagnose the infectious disease. The student will analyze prepared case studies and answer questions regarding the case and the causative agent in the form of homework assignments, class discussions and by composing their own case study with information from the literature, textbooks, and the Internet. Prerequisites: CLS 321 or CLS 521. [2-0-2]

CLS 443/543 Special Topics Case Studies
The student will analyze prepared case studies in an areas of special interest, and answer questions regarding the case in the form of homework assignments, class discussions and by composing their own case study with information from the literature, textbooks, and the Internet. Prerequisites: Departmental permission. [v-v-v]

CLS 451/551 Patient Care Techniques
Techniques of specimen collection and phlebotomy are discussed and practiced. Students perform venipuncture and fingerstick procedures on in-house patients throughout the various areas of the hospital. Pediatric and geriatric patients are included, as are general medical/surgical patients. Procedures for specimen processing and result reporting are learned. Departmental permission required. [0-v-v]

CLS 461/561 Regulatory Issues
This course is designed to present the various regulatory requirements under which clinical laboratories function. Regulatory agency requirements such as JCAHO, CAP, and FDA will be discussed. Students will become familiar with these regulatory requirements and be prepared to manage a clinical laboratory, which meets all regulations. Departmental permission required. [2-0-2]

CLS 464/564 Comprehensive Review
A comprehensive review of the CLS curriculum. Course culminates in a mock-computerized examination. Departmental permission required. [2-0-2]

CLS 481/581 Advanced Practicum in Hematology
Course includes application of skills learned in Hematology course work. This is a clinical rotation through the hospital hematology laboratory. Instrumentation and advanced methodologies, special hematologic testing techniques, bone marrow techniques, and coagulation are included. Departmental permission required. [Variable: 2-4]

CLS 482/582 Advance Practicum Microbiology I
Rotation through the hospital clinical bacteriology, anaerobe and acid fast laboratories. Instrumentation and advanced methodologies are emphasized. Departmental permission required. [Variable: 2-4]

CLS 483/583 Advanced Practicum Microbiology II
Rotation through the hospital clinical parasitology, mycology and virology laboratories. Instrumentation and advanced methodologies are emphasized. Departmental permission required. [Variable: 2-4]

CLS 484/584 Advanced Practicum in Immunohematology
Rotation through the hospital blood bank laboratory. Instrumentation and advanced methodologies are emphasized. Departmental permission required. [Variable: 2-4]

CLS 485/585 Advanced Practicum in Immunology and Molecular Diagnostics
Rotation through the hospital clinical immunology and molecular diagnostic laboratories. Areas included are serology, HLA, complement testing, flow cytometry, karyotyping, molecular oncology, PCR, DNA sequencing, FISH probe analysis and other diagnostic procedures. Departmental permission required. [Variable: 2-4]

CLS 486/586 Advanced Practicum in Clinical Chemistry
Rotation through the hospital clinical chemistry laboratory. Areas covered are instrumentation, blood gasses, electrolytes, comprehensive metabolic profiles, thyroid function, therapeutic drug monitoring and fertility studies, as well as advanced methodologies in the above areas. Departmental permission required. [Variable: 2-4]

CLS 490 Clinical Specialty Practicum
(Graduate students will register for the Master Project in place of the Specialty Practicum.)
The Specialty Practicum provides students with an opportunity to select a specific laboratory of interests to them. Students spend five weeks developing advanced techniques and exploring the latest technology available in the clinical laboratory. Areas may include bone marrow cell analysis, advanced genetics, advanced hematology, retrovirology and laboratory safety. Departmental permission required. [0-v-v total of 4]

CLS 491/591 Clinical Practicum - Hematology
Course includes application of basic skills learned in Hematology course work. This is a clinical rotation through the hospital hematology laboratory. Basic skills learned in the student laboratory are practiced. Instrumentation and advanced methodologies, special hematologic testing techniques, bone marrow techniques, and coagulation are included. Departmental permission required. [0-v-v total of 4]

CLS 492/592 Clinical Practicum - Microbiology I
Rotation through the hospital clinical bacteriology, anaerobe and acid fast laboratories. Applications of basic skills learned in the student laboratory are practiced. Instrumentation and advanced methodologies are emphasized. Departmental permission required. [0-v-v total of 4]

CLS 493/593 Clinical Practicum - Microbiology II
Rotation through the hospital clinical parasitology, mycology and virology laboratories. Applications of basic skills learned in the student laboratory are practiced. Instrumentation and advanced methodologies are emphasized. Departmental permission required [0-v-v total of 4]

CLS 494/594 Clinical Practicum in Immunohematology
Rotation through the hospital blood bank laboratory. Applications of basic skills learned in student laboratory are practiced. Instrumentation and advanced methodologies are emphasized. Departmental permission required. [0-v-v total 4]

CLS 495/595 Clinical Practicum in Immunology and Molecular Diagnostics
Rotation through the hospital clinical immunology laboratories. Application of basic skills learned in the student laboratory. Areas included are serology, HLA, complement testing, flow cytometry, karyotyping, molecular oncology, PCR, DNA sequencing, FISH probe analysis and other diagnostic procedures. [0-v-v total 4]

CLS 496/ 596 Clinical Practicum in Clinical Chemistry
Course includes application of basic skills learned in the student laboratory. Areas covered are instrumentation, blood gasses, electrolytes, comprehensive metabolic profiles, thyroid function, therapeutic drug monitoring and fertility studies, as well as advanced methodologies in the above areas. Departmental permission required. [0-v-v total 4]

CLS 497/597 Clinical Practicum in Education
Rotation through the various diagnostic clinical laboratories. Students will be evaluated on their skills and knowledge and complete the additional competencies required in the regular program clinical practicums. Departmental permission required. [0-v-v]

CLS 499/599 Independent Study
Requires departmental permission. [v-v-v]

CLS 562 Marketing & Negotiations
Vendor relations, contract negotiations, product cost analysis and marketing strategies will be discussed. Students will have the opportunity to become involved in actual contract negotiations and marketing of laboratory services. Departmental permission required. [3-0-3]

CLS 563 Issues in Pathology
Work flow analysis and clinical experience in an anatomical pathology laboratory. This will include anatomical pathology, cytology and histology. Management issues unique to these areas will be discussed and studied. Management and supervision issues unique to these areas will be examined. Departmental permission required. [3-0-3]

Medical Technology

A graduate course listed with the equivalent undergraduate course requires additional competencies to meet graduate level credit. Students normally take both CLS and MTK coursework.

MTK 301/509 Information Science
Introduction to personal computers, Microsoft Office, E-mail and the Internet. Students participate in a research project involving data collection via the World Wide Web. Departmental permission required. [2-0-2]

MTK 311-511; 412-512 Professional Development Projects
Participation in a professional enrichment project varying from 1-5 quarters in length. Projects include, but are not limited to, the following: practical experience at alternate sites in which medical technologists work, e.g. local clinics, health centers, nursing homes, research facilities, various industrial firms, and/or community hospitals; community activities such as presenting information sessions to senior citizen groups, various professional groups or at local association and club meetings; participation in the development of science fair projects and science fair judging at local area schools; areas of special research interests; other areas chosen for their enrichment potential. Departmental permission required. [0-v-v]

MTK 403/503 Laboratory Management
Fundamentals of management including human resource management, finance and reimbursement, quality assessment and improvement, leadership, communication, and decision making/judgment skills will be emphasized. Interactive sessions employing problem based learning techniques help the student understand important leadership and management concepts. Departmental permission required. [3-0-3]

MTK 404/504 Communications
Interpersonal and organizational communication techniques for creating effective communication with subordinates, peers and managers. Consultation and project management techniques will be included. Departmental permission required. [2-0-2]

MTK 406/506 Laboratory - Supervision and Education
Fundamentals of management and supervision including human resource management, finance and reimbursement, quality assessment and improvement, leadership, communication, and decision making/judgment skills will be emphasized. Interactive sessions employing problem based learning techniques help the student understand important leadership and management concepts. Departmental permission required. [3-0-3]

MTK 442/542 Medical Technology Seminar II
Students in this course will cover the latest in Clinical Laboratory Science through the review and presentation of leading journal articles to a select audience of clinical laboratory professionals and students. Students will appreciate the need for continuing education in the field of clinical laboratory science. Departmental permission required. [2-0-0]

MTK 491/591 Research Seminar I
This course is designed basically as a research project support group. Various research designs, sampling techniques and data analysis methods will be discussed. Each student will present abstracts of current research and have the opportunity to discuss their research project topic, obtain help with problem areas, and generally benefit from the research efforts of their fellow students and faculty. Principles of education and instruction are presented in this course. Students are asked to prepare a short educational presentation following principles presented. Departmental permission required. P/NP grading. [2-0-2]

MTK 592 Research Seminar II
Continuation of MTK 591, Research Seminar I. P-N grading. Prerequisite: MTK 591. [2-0-2]

MTK 593 Research Seminar III
Continuation of MTK 591, Research Seminar II. P-N grading. Prerequisite: MTK 592. [2-0-2]

MTK 594 Master Project I
Student projects designed in various areas of the clinical laboratories, which focus on clinical testing, management and supervision issues. Students are required to formally present the results of their projects to the faculty and student body, and are encouraged to publish their results. Departmental permission required. [0-v-v]

MTK 595 Master Project II
Continuation of MTK 594. [0-v-v]

MTK 596 Master Project III
Continuation of MTK 595. [0-v-v]

Graduate College Core and Interdisciplinary Courses

GCC 501 Molecular Biology: Genome to Proteome
DNA structure, replication, recombination, cloning, sequencing and related topics will be covered. This course will continue with organization of the human genome, the cell cycle, genetic mapping and relationships between genes and diseases. Transcriptional and translational regulations will be included. FA [3]

GCC 502 Cellular Biochemistry: Proteins, Transport & Signaling
Concepts of cellular biochemistry which underly the structure, organization and communication of cells will be presented. Protein, carbohydrate and lipid structure and function in cellular organization will be covered. Special emphasis will be placed on the roles of enzymes, signaling systems, receptors and membrane transport systems in cell function. This section will also overview neurons, synapses and neurotransmitters. FA [2]

GCC 503 Functional Cell Biology
The major concepts of cell structure and function will be covered. Topics include tissue origin and organization, extracellular matrix, cytoskeleton, cell-cell adhesion, organelles and compartments, endocytosis, exocytosis, metabolic requirements for signal transduction, cell motility, and regulation of cell proliferation. FA. [2]

GCC 504 Functional Tissue Biology
The biochemical and cellular basis for tissue structure and function will be covered. Topics include systems histology and anatomy, immunity, tissue injury and repair/regeneration, regulation of cell-cell adhesion, apoptosis, endocrinology, pharmacology, and toxicology. WI [2]

GCC 505 Techniques in Biomedical Sciences
This course will provide a didactic overview and a demonstration of certain laboratory techniques. Topics include electrophoresis, genomics, PCR, tissue culture, cell-sorting techniques, ELISA, chromatography/LC mass spectrometry, imaging techniques, histocytochemistry, and microscopy. FA [2]

GCC 506 Biomedical Ethics
The major issues of honesty and fairness as practiced in the scholarly pursuit of new knowledge will be reviewed. Topics include equal opportunity and non-discrimination, abusive relationships, student-faculty relationships, responsibilities of students, faculty, chairmen and administrators, honesty in writing, authorship, and ownership of data. WI [1]

GCC 507 Medical Research Strategies
This is an introduction to study design and hypothesis testing. Topics include data definition, study design, probability theory, confidence intervals, hypothesis testing, and the techniques used in modern biostatistics. SP [2]

GCC 508 Writing Practicum
This is a hands-on writing course which focuses on the requirements for abstract, manuscript and grant application writing. Topics include abstract writing, manuscript writing and grant writing. Each topic is covered in several sub-components. SP [2]

GCC 521 Critical Reading
This is a journal club which requires the student to critically evaluate published work. FA, WI, SP [1]

GCC 522 Problem-based Learning
Research problems, posed by the faculty, will be understood, developed and solved by students in a cooperative, interactive application of computer and library resources. FA, WI, SP [2]

GCC 531 Laboratory Techniques I
This series of laboratory courses provides direct experience in the major laboratory methods and techniques commonly used in the modern research laboratory. The objective of this series is to prepare the student for direct entry into biomedical research and development in industry or in an academic setting. FA [2]

GCC 532 Laboratory Techniques II
FA [2]

GCC 533 Laboratory Techniques III
WI [4]

GCC534 Laboratory Techniques IV
WI [3]

GCC 535 Laboratory Techniques V
SP [5]

GCC 536 Laboratory Techniques VI
SP [4]

Healthcare Education

HCE 581 Introduction to Research
The student develops skill in critically analyzing research studies, formulating research problems, designing research methods, using descriptive and inferential statistics to interpret data, analyzing data using parametric and nonparametric statistical models, and developing beginning competencies in the use of computers in research. [v-v-4]

Religion, Health, and Human Values

HHV 501 Introduction to Health Care Ethics
This interdisciplinary course considers representative foundational theories of ethics, religious perspectives, and methodology, as well as selected issues such as paternalism vs. enhancement of patients' autonomy; justice; beneficence vs. nonmalfeasance; legal issues, public policy. [3-1-3]

HHV 502 Major Issues in Health Care Ethics
Focus of the course is on "End of Life—Ending Life" with topics such as advance directives, DNR's, withholding and withdrawing treatment, treatment decisions and ethics, PVS, brain death, euthanasia, allocation, etc. Both ethical and legal perspectives are considered. Prerequisite HHV 501. [3-1-3]

HHV 503 Seminar in Health Care Ethics
Students present a major seminar paper on an approved topic in clinical health care ethics, and lead discussion around the issue. Prerequisite HHV 502. [3-1-3]

HHV 504 Psychology and Health Care Ethics
The relationship between psychological issues such as personality, family systems, individual and family life cycle, death and dying, mediation/negotiation, and ethical dilemmas is explored. Prerequisite HHV 501. [3-0-3]

HHV 505 Ethics in Research
This web based course provides the student with an interactive format to discuss the researcher's responsibilities for conducting ethically sound scientific research as well as select ethical issues in research. Each student will have the opportunity to analyze an ethical issue as it relates to the student's research project or topic. [1]

HHV 507 Operations and Health Care Ethics
A seminar offering readings, practicum, and reflection integrating day-to-day operational issues with ethics theory and method. [2-0-2]

HHV 510 Seminar in Health and Human Values I
Interdisciplinary seminar integrating the written, visual and performing arts with philosophical and clinical issues and approaches to health care. Includes Campbell Lectures each quarter taken. [v]

HHV 512 The Clinic and the Classics
This interdisciplinary course is divided into three parts: an intensive introduction to ethical theories and methodologies; a review of law, ethics and medicine; and a case-oriented focus on specific issues in health care ethics. In addition, the impact of ethnicity, religion, class, and gender on moral decision-making will be considered. Prerequisite: admission to doctoral program. [4-0-4]

HHV 525 Narrative and Medicine
A characteristic of the human species is that we think in metaphors and learn through stories. In the midst of crises, persons construct stories that give meaning to events. This course is designed to focus on understanding how persons create meaning out of the experiences of disease and suffering. Through improvisational exercises, students discover how to be in tune with stories and their tellers. [v-v-v]

HHV 532 Introduction to Holistic Spiritual Assessment
In the context of a review of holistic approaches to patient assessment, this course provides an introduction to spiritual assessment. Several significant models for spiritual assessment are presented and evaluated. The models are applied with case studies and/or patient interviews. [3-0-3]

HHV 533 Theology of Pastoral Care
A seminar in which students study various theological approaches to pastoral care and formulate their own theology of the discipline. [2-0-2]

HHV 534 Suffering
Health care practitioners inevitably engage the issue of human suffering. Course examines the nature of suffering, the suffering of the healthier, approaches to living with suffering. [1]

HHV 535 Spirit/Mind/Body
Course examines research of faith and health outcomes, psychoneuro-immunology, mind/body concepts, complementary therapies, and an introduction to the practice of proven techniques for enhancing health through spirit/mind/body integration. [3-0-3]

HHV 541, 542, 543 Seminar in Theological Reflection I - III
Using a "story theology" model, students bring narratives from their own experience as well as from the experience of patients/clients to discern major theological themes. [1-1-1]

HHV 551, 552, 553 Clinical Practicum I - III
Supervised clinical experience in a setting appropriate to learning goals. Settings may include in-patient chaplaincy, trauma crisis or ethics. [v-v-v]

HHV 554 Clinical Practicum IV
Students are paired with a working ethics consultant for rounds and general ethics coverage for one part of the course. Group reflection on cases and consultation method constitutes the other part of the course. [v-v-v]

HHV 581 Reading and Research in Health Care Ethics
Independent guided study in selected current topics in healthcare ethics. Prerequisite HHV 501. [v-v-v]

HHV 586 Reading and Research in Religion and Health
Individual projects under the supervision of faculty member.

HHV 597 Health Care Ethics Project
(3)

HHV 598 Thesis in Health Care Ethics
(4)

HHV 599 Independent Study
[v]

Health Systems Management

HSM 370 Intro to Health Care Organizations
The focus of this course is on direct health care services as a business/service endpoint. Roles and responsibilities of health care personnel will be covered. The influence of financing health care on the organization and delivery of care is also discussed. This introduction to the structure and function of the U.S. health care system is designed for the non-health care professional. Prerequisite: At least three years of undergraduate work in any major. [2]

HSM 501 Professional Skills Development
This course improves students' effectiveness in leadership roles, by developing their skills in designing and delivering formal presentations, authoring written business communications, facilitating meetings, and working within teams and other networks. [1]

HSM 502 Health Care Organizations
This course provides an overview of the United States health care system, its structure, major components and overall performance. The interrelationships among various trends and forces that are likely to shape the roles and responsibilities of health care institutions in the future will be stressed. The course makes use of guest lecturers from the field, site visits to health care institutions, and rotations with various healthcare professionals. Through these experiences, students should become well versed and conversant in the major topics facing the health care industry. These experiences will also stimulate thinking about the major issues facing the system and the public/private/individual roles in addressing these issues. This course will provide a framework to organize knowledge of the health care system to support further study in the field. It serves as an introduction to issues and concepts in HSM courses in organizational behavior, health economics, health care finance, health care marketing, and managed care. [4]

HSM 507 Epidemiology
The course provides an understanding of the principles and methodologies of epidemiology, research design, and program evaluation emphasizing application to the planning and management of health care services. These principles are applied in a community assessment project. Prerequisite: HSM 582 or concurrently. [3]

HSM 510 Health Care in America: An Overview for Health Professions Students
Health Care in America is designed for students who are entering a health profession. Faculty leaders from across the Medical Center present topics that address contemporary issues in America's health care system. Examples include the organization and delivery system, the economics and financing of health care, the national's health care workforce, long-term care, technology and health care, biomedical ethics, health policy and the public's health, and future directions of America's health care system. Following presentations, the class breaks into interdisciplinary groups lead by faculty to explore those and other class-developed questions about health care in America. [2]

HSM 515 Human Resources Management
The course focuses on providing an understanding of the human relations skills required of the health systems manager in an environment filled with both federal and state legal constraints. Skills acquired include motivating and coaching employees, appraising and improving performance, dealing with disciplinary problems, and employee counseling. [3]

HSM 531 Finance I: Accounting Principles
This course is designed to provide an understanding of the concepts/principles of accounting and finances and their application in health systems management. Prerequisite: Undergraduate Accounting. [4]

HSM 532 Finance II: Health Care Managerial Accounting
The focus of the course is to provide an understanding/knowledge of health care services payment policies including payment sources, [e.g., Medicare, Medicaid, traditional insurance] emerging payment arrangements, e.g., DRGs, capitation, PPOs, HMOs and application of budgeting principles to health care institutions. Prerequisite: HSM 531. [3]

HSM 533 Health Care Economics
Students will learn the principles and tools of microeconomics and apply these principles and tools to the health care market. Applications particularly pertinent in today's political and economic climates include the demand and supply of health care, physician productivity and incentives, managed care, medical malpractice and pharmaceutical economics. By quarter end, students should be able to evaluate, both at a conceptual and at an analytical level, arguments about how the markets for healthcare and health insurance work. Prerequisite: HSM 582 or concurrent. [4]

HSM 536 Corporate Finance
The course provides the financial tools and ability to understand the principle issues of corporate finance and financial management. The overall objectives of the course are to understand the roles, functions and responsibilities of financial officers in managing a health care institution; be able to identify and analyze corporate finance problems and issues in the management of health care institutions and be able to evaluate the financial performance of institutions in asset and debt management. Cash flow, financial management of assets, timing and uncertainty and access to the capital markets are covered in order to understand the importance of finance to health care operations and strategic planning. Prerequisites: HSM 531, 532, 533. [4]

HSM 539 Finance Seminar
This course focuses on the application of knowledge and skills acquired in the HSM finance course and the integration of decision-making processes. Students make strategic planning, staffing, capital financing, pricing, and cash management decisions for a health care institution under changing environmental trends and payment policies. These decisions will affect the institution's financial position relative to other hospitals in the community through a computer simulation model. Prerequisites: HSM 531, 532, 536, 567. [2]

HSM 543 Health Law
Provides a systematic and comprehensive knowledge of law as it impacts health care delivery systems. Students acquire an understanding of areas of law such as HIPAA, Fraud and Abuse, False Claims, employment/labor, contract and corporate law, tort liability, and laws governing patient care such as consent, guardianship and mental health laws. [4]

HSM 545 Organizational Analysis
This course develops students' knowledge of organizational structure and their skills in facilitating organizational change, focusing on theories and concepts in change management, organizational research, motivation, stress, leadership, group dynamics, roles, decision making, strategic planning, communication and information systems, quality management and ethics. Prerequisites: HSM 502, 515, 582. [3]

HSM 547 Strategic Analysis in Health Care
Strategic Analysis provides students with an operational, working understanding of the fundamentals of strategic planning, strategic analysis, decision making and analytical techniques. Students will apply techniques of situational assessment, data analysis, strategy development and problem solving. Additionally, as a capstone course, students are encouraged to integrate and refine their knowledge from all sources to apply to business case studies. Students will conduct strategic analysis and make strategic recommendations consistent with the mission, vision, and values of an organization. They develop and present strategic recommendations and analysis under the guidance of senior health managers. The result will be an improved ability to think and write critically, identify strategic challenges and complete strategic analysis for different business problems. Prerequisites: HSM 531, 532, 533, 562. [4]

HSM 551 Information Systems I
Basic information systems concepts are presented e.g., systems theory (analysis, design, life cycle), hardware, software, database, telecommunications, use of the Internet and Web, and fundamentals of information systems management and organization. [3]

HSM 552 Information Systems II
This course will concentrate on intermediate to advanced concepts of information systems. Specific topics may include: information systems resource management, cost/benefit analysis, overview of information system topology, technology assessment and strategic planning. Prerequisite: HSM 551. [3]

HSM 556 Health Care Information Management Seminar
This course will discuss contemporary issues aimed at improving the strategic alliance of business decision-making regarding information technology in a health care organization, including establishing a governance structure, evaluating the on-going efficacy of IT in an organization, and other contemporary issues related to IT. Prerequisites: HSM 507, 551, 552, 571, 582. [1].

HSM 557 Quality in Health Care
Provides students with fundamentals of quality improvement in health care. Emphasis is placed on philosophy, framework, and methodology of quality improvement, including measurement, analysis, organization and the impact of external standards. Knowledge of Excel is desirable. [3]

HSM 559 Health Care Marketing and Communications
This course develops students' understanding of the health care marketing and communication processes. Among the topics covered are consumer research; market segmentation; price, distribution and product strategies; advertising and promotion; mass communications / public relations; and evaluation. The development of persuasive marketing communication is studied from theoretical and practical perspectives. Prerequisites: HSM 502, 582. [3]

HSM 560 Health Care Policy
This course will prepare students to analyze the health policy process via empirical examination of policy formulation, implementation and outcome evaluation. The student will learn to apply these skills in an organizational context, to assist organizations to respond to policy opportunities and threats. [3]

HSM 567 Managed Care
An examination of managed care organizations in theory and practice. The variations in model types and external forces affecting their development and operational strategy will be explored. The provider, insurer, and community perspectives of managed care will be discussed with applied research examining these perspectives provided by the students. [3]

HSM 571 Operations Management
This course will refine the student's ability to formulate and critically evaluate operational processes in the healthcare delivery system. Emphasis will be placed on the use of quantitative techniques for problem-solving and decision-making relative to the efficiency and effectiveness of operational processes. Pre-requisites: HSM 582 and HSM 551 or concurrent. [3]

HSM 576 Ethics in Health Care Management
This course teaches students how to analyze complex issues in healthcare management in order to make appropriate decisions. The course provides an overview of ethics concepts, frameworks for analyzing issues from multiple stakeholder perspectives, and practice using cases and current topics. [1]

HSM 579 Governance and Leadership in Health Care
This course develops students' understanding of effective governance and leadership of health care organizations, including methods for assessing leadership and ethical challenges in organizations and weighing alternative courses of action. It is designed to prepare students for positions with managerial responsibility, and includes an assessment of leadership skills and development needs. Prerequisites: HSM 502, 515, 545. [3]

HSM 582 Intermediate Statistics
This course reviews basic statistics and introduces intermediate level tests which a health systems manager will likely use operationally or in empirical research. The statistical tests include t-tests, ANOVA, Chi-Square, simple and multiple regression, and appropriate nonparametric techniques. Students will be taught how to use SPSS statistical software. They will learn the principles of proper research study design, and learn how to interpret the statistical results in published health care journal articles. Knowledge of univariate statistics and basic knowledge of personal computing in a Microsoft environment is presumed. Prerequisite: Undergraduate Statistics. [4]

HSM 590 Topics in Health Systems Management
This course presents one-credit courses on current issues in health care. In the past, topics have included international health care, facilities planning, decision analysis, technology assessment and health care and the elderly. [1 credit per topic]

HSM 597 Master's Project
This two-quarter course provides the advanced HSM student the opportunity to integrate quantitative methods with health care management and skills. The student will design and test a hypothesis that addresses a problem important to the delivery or management of health care. Major emphasis is placed on project and data management, oral and written communication skills and quantitative analytic techniques. Prerequisites HSM 502, 507, 533, 582. [8]

HSM 599 Independent Study
Specialized course work designed around the needs of an individual student. [Variable credit - with permission].

HSM 620 Adult Learning Theory and Methods
Reviews models of adult learning theory as it relates to higher education and career / continuing education contexts, as well as methods for conducting training evaluations and using evaluations for continuous quality improvement. Provides hands-on practice with developing curriculum descriptions, course outlines, and course content for specific adult learning audiences, using both synchronous and asynchronous approaches. [3]

HSM 624 Leadership Theory and Practice
Using a validated health administration model, this course assesses participant leadership skills / potential, developing familiarity with methods for developing leadership skills, and assisting participants in formulating career development plans given their individual goals and skill development needs. Approaches to organizational learning and competency tracking will also be reviewed. [3]

HSM 630 Research Methods I: Sampling and Survey Design
Reviews simple, systematic, stratified, cluster, sampling techniques and combinations thereof including sample size calculations for each method and applications using sample size software. Computerized survey form design and database management are discussed. Prerequisite: Graduate level biostatistics. [3]

HSM 650 Interdisciplinary Practicum and Seminar I: Public/Community Health
An interdisciplinary team of at least two different allied health professionals assess the needs of a geographically defined area; devises a plan with a community-based agency for promoting healthy lifestyles and health services based upon epidemiologic principles, marketing theory; and, theories of health promotion. Health needs of the community and team plans for addressing these are discussed in seminar. [3]

HSM 675 Ethics for Executive Clinical Leadership
Review of various leadership theories relative to ethical implications of the various leadership styles. Discussion of dilemmas of balancing organizational survival goals relative to employee considerations, succession planning, and potential conflicts of interest. Prerequisites: HSM Leadership Theory and Practice and HSM Interdisciplinary Practicum and Seminar I. [2]

Immunology

IMM 502 Introduction to Experimental Immunology
A graduate introductory course covering basic concepts in experimental immunology including basic laboratory techniques. FA [3-0-3]

IMM 505 Immunology
Introduction to immunology with emphasis on basic concepts and principles, interwoven with a study of their clinical applications. Medical students only. SP [5] [53 hours]

IMM 510 Ethics in Research
A seminar/discussion course that explores the major ethical problems encountered in the conduct of research. Topics covered include: falsification/fabrication of data, plagiarism, misuse of statistics, bias, ownership and sharing of research data and products, informed consent in human research studies, authorship, mentoring, genetic research, use of animals in research and whistleblowing. SP [1-0-1]

IMM 521 Basic & Clinical Immunology: Lecture Segment
A comprehensive introduction to immunology, with emphasis on basic concepts and principles, and clinical applications. SP [5-0-5]

IMM 522 Immunology Tutorial
Companion course to IMM 521 with emphasis on experimental and animal models. SP [1]

IMM 531 Advanced Immunology
A comprehensive course in molecular and cellular immunology including lymphocyte ontogeny, cellular interactions, and effector cell functions, immunogenetics and tumor registry. Alt. WI [4-0-4]

IMM 571 Laboratory Tutorial
Individual program, acquaints the student with research protocols and interests within the department. [v-v-v]

IMM 575 Advanced Readings in Immunology and Virology
In this course, students will choose, under the direction of the faculty coordinator, one or more papers from the recent scientific literature, and present it orally to the class. Presentations will provide adequate background to the topic, explanation and assessment of the relevant methodology employed, interpretation of results, discussion of the significance, and validity of the conclusions. Each student will make at least one presentation per quarter. Grading is Pass/No Pass only. FA WI SP [1]

IMM 581 Introduction to Immunology Research
The objectives of this course are to: 1) Introduce the theoretical and practical use of common tools in biological research, with an emphasis on molecular biology and immunology, and data interpretation using these tools; 2) Present the process of manuscript writing for publication; and 3) Provide an overall review of biostatistics and the use of a statistical software package for data analysis. SP [2-0-2]

IMM 582 Introduction to Immunology Research
The course is designed to cover the areas: 1) Theoretical and practical use of common tools in biological research, with an emphasis on molecular biology and immunology, and on data interpretation; 2) Biostatistics and especially the use of a statistical software package for data analysis; and 3) Manuscript writing. The first of two practical exams will assess the ability of a student to interpret and write a manuscript based on a portfolio of data. The second exam will test data analysis using a statistical software package. [3]

IMM 585 Research Seminar
Seminar on contemporary topics in immunology and virology. FA WI SP [1-0-1]

IMM 590 Special Topics
Detailed study of contemporary topics in immunology are presented in a five week block. Topics such as inflammation, host defense, membrane structure, and antigen presentation are included. [v-v-v]

IMM 598 Pre-Dissertation Research
Research credits prior to acceptance to doctoral candidacy. [v-v-v]

IMM 599 Independent Study
Specialized course work designed around the needs of an individual student. [v-v-v]

IMM 699 Dissertation Research
Research credits after admission to candidacy. [v-v-v]

Internal Medicine

MED 501,502, 503 Clinical Pathophysiology I, II, III
Serving as a bridge between the basic sciences and clinical medicine the course helps to make the student conversant with the limits of biochemical and physiologic responses under a variety of stresses and disease states. Emphasis is in three basic areas: abnormal, general cellular biology; homeostasis; and organ system pathophysiology. The course closely coordinates with topics in the pathology course and also with didactic material to be presented during the third-year clinical program. FA WI SP [171 hours]

Microbiology

MIC 451 Microbiology Concepts I
An introduction to the morphological and physiological characteristics of infectious agents of importance in human disease. SP [5-1-5] [55 hours]

MIC 452 Microbiology Concepts II
Continuation of MIC 451.

MIC 501 Clinical Bacteriology
Provides rotations through each section of the diagnostic bacteriology laboratory with emphasis on laboratory identification of bacteria. Prerequisite: MIC 451. [v-v-v] [4 weeks]

MIC 521 Molecular Biology
A graduate introductory course covering general principles and experimental applications of nucleic acid structure, function and manipulation in eukaryotic cells. WI [4-0-4]

MIC 524 Human Molecular Genetics
Contemporary study of topics in gene organization, transcription, translation, and gene regulation in humans. SP [2-0-2]

MIC 531 Virology
Advanced study of human and animal viruses and their interactions with cells. SP [5-0-5]

MIC 590 Special Topics
Detailed independent study of contemporary topics in microbiology. [v-v-v]

MIC 599 Independent Study
Specialized course work designed around the particular needs of an individual student. [v-v-v]

Medical Physics

MPH 457 Radiation Safety of Radioactive Materials
Course reviews basic nuclear and health physics principles/practices, regulations and instrumentation for the safe use of radioactive material. FA [2-0-2]

MPH 458 Radiation Detection and Measurement
A study of basic physics principles and applications with laboratory exercises on techniques and instrumentation for nuclear radiation detection and measurement as they relate to nuclear physics and radiation safety of radioactive materials. Prerequisite: MPH 457. WI [1-3-2]

MPH 460 Introduction to Medical Physics
An introductory course in physics for residents in diagnostic radiology, nuclear medicine and radiation oncology. The course covers medical x-ray equipment design and use, clinical dosimetry, and quality assurance SU [3-0-3]

MPH 461 Physics of Diagnostic Radiology
Intermediate physics for residents in diagnostic radiology and nuclear medicine. Prerequisite: MPH 460 FA [3-0-3]

MPH 463 Physics of Nuclear Magnetic Resonance Imaging
This course is a basic introduction to the physical principles of MRI with emphasis on proton MRI. Topics covered will include fundamentals of magnetic resonance, relaxation times, and the basis for imaging techniques. FA [2-0-2]

MPH 464 Concepts in Magnetic Resonance Imaging
The course provides an overview of magnetic resonance principles as applied to image formation. Fundamental proton magnetic resonance concepts as well as basic imaging principles will be discussed for medical residents in radiology. This course is structured as a subset of MPH 463. FA [1-0-1]

MPH 465 Topics in Diagnostic Imaging
Discussion of advanced topics in diagnostic imaging : mammography, digital imaging, ultrasound, quality assurance and radiation protection. Prerequisite MPH 461. FA [2-0-3]

MPH 471 Physics of Nuclear Medicine I
The course covers mathematics and detectors used in nuclear medicine. Imaging instrumentation, including scintillation camera, emission tomography, and application of the computer to nuclear medicine is also covered. SP [3-0-3]

MPH 475 A Workshop in Radiopharmaceutical Science
Covers production of radionuclides, generators, formulation and Q.C. of tracers for 16 organ localization, in vitro and in vivo studies, dosimetry, FDA and safe handling. Compounding, biodistribution, and imaging studied in laboratory. [1-0-1]

MPH 481 Introduction to Medical and Therapeutic Radiological Physics
An introductory course in physics for residents in radiation oncology covering all materials of MPH 460 with additional clinical dosimetry and laboratory demonstrations. SU [3-3-4]

MPH 482 Therapeutic Radiological Physics
Intermediate physics for residents in radiation oncology. The five p's' of radiation therapy physics are examined: prescription, physical dose, planning, precision, and pattern of treatment outcome. Interactions of x-rays and gamma-rays, measurement of exposure, calibration of high-energy photon and electron beams, and dose distributions for external-beam therapy are studied. Prerequisite: MPH 460. FA [3-0-3]

MPH 483 Dosimetry Applied to Therapeutic Radiology
An introductory course in clinical medical physics for therapeutic radiology trainees, including residents, graduate students, dosimetrists and technologists. SU [3-1-4]

MPH 484 Brachytherapy Physics
This course is designed for residents in therapeutic radiology and graduate students. Topics include basic physics of radioactivity, and use of radioactive isotopes in clinical radiotherapy. Prerequisite: MPH 482 WI [2-0-2]

MPH 486 Introductory Hyperthermia
This course will cover the physical and biological mechanisms of hyperthermia, as well as methods for delivery of heat energy for cancer therapy. Prerequisite: MPH 482 WI [2-0-20

MPH 490 Diagnostic Radiological Physics Review
Intensive review in all branches of medical radiological physics for preparation for the American Board of Radiology Certification Examination. Prerequisites: MPH 461, 471 [3-0-3]

MPH 491 Introduction and Application of Computers in Medical Physics
Course covers basic components and systematic presentation of computer programs useful in medical physics. [2-0-2]

MPH 492 Radiotherapy Physics Review
Intensive review for therapeutic radiology residents and graduate students in medical physics in preparation for the American Board of Radiology Certification Examination. [2-0-2]

MPH 501 Radiation Physics
Course provides a rigorous examination of the interaction with matter and heavy-charged particles with matter. FA [4-0-4]

MPH 502 Radiological Physics I
The course covers design and operation of accelerators; radiation quantities and units including stochastic and nonstochastic quantities; ion collection and recombination; and dosimetry systems used in therapeutic radiology and radiobiology. Prerequisite: MPH 501. WI [4-0-4]

MPH 503 Radiological Physics II
Continuation of MPH 502. SP [4-0-4]

MPH 504 Topics in Medical Physics
Course covers selected topics in radiation detection, interaction, and protection. Topics will also be selected from radiation dosimetry and diagnostic and therapeutic imaging. Prerequisite: MPH 502 [v-v-v]

MPH 505 Radiological Physics Laboratory
A practical course directed towards understanding of the instruments, computers, apparatus, and facilities used in applied radiation work. Includes carrying out scientific evaluation and essay-type reporting. MPH 502. [v-v-v]

MPH 506 Clinical Physics Practicum
Students participate in providing clinical physics service under supervision. Practica currently available are offered each term in: MPH 506A Diagnostic Imaging, MPH 506B Radiation Therapy, MPH 506C Radiation Protection. [v-v-v]

MPH 535 Fundamentals of Radiation Biology
This course describes the effects of ionizing radiation on both individual cells and on the human being as a whole. Factors that modulate these effects, such as oxygen, dose rate, and various chemcials, will be explored. This course is suitable for residents in radiation oncology, nuclear medicine, and diagnostic radiology, as well as graduate students with an interest in radiation effects.

MPH 536 Clinical and Molecular Radiation Biology
This course will develop the basis for clinical fractionation of radiation therapy and a model of tumor control probability from the principles of radiation biology. The molecular biology of cancer, together with molecular strategies such as gene therapies to improve the effectiveness of radiation therapy, will be surveyed. MPH 535 is a prerequisite.

MPH 542 Radiation Oncology
Basic concepts and principles of nonsurgical cancer management. The natural history of cancers in various organs will be reviewed and therapeutic strategies developed based on the pathophysiology of different cancer sites. [2-0-2]

MPH 565 Transfer Function Analysis
Starting with a rigorous presentation of Fourier transform theory, this course develops transfer function analysis for application to imaging systems. FA [2-0-2]

MPH 566 Digital Immaging
Course is organized as several computerized exercise modules providing students with "hands on" experience in various digital imaging concepts. Prerequisite: MPH 565. WI [3-0-3]

MPH 581 Methods of Photon Dose Calculation
Current methods of photon dose calculation for radiation treatment planning systems, particularly those using interaction kernels. Prerequisite: MPH 565. [2-0-2]

MPH 582 Methods of Electron Dose Calculation
Methods of electron dose calculation for radiation treatment planning systems, particularly those based upon Gaussian multiple-scattering theory. Prerequisite: MPH 565. [2-0-2]

MPH 583 Monte Carlo Methods
The EGS4 Monte Carlo code for photon/electron transport will be explained, with emphasis upon gaining "hands on" experience in using this research tool. [2-0-2]

MPH 590 Medical Physics Research Seminar
This seminar serves as a forum for review of the ongoing research by the faculty, appropriate staff members, fellows, and graduate students. [1-0-1]

MPH 597 Introduction to Research
The student will undertake a directed project with a faculty member as an introduction to research. [v-v-v]

MPH 598 Research
Under the guidance of a faculty member and committee, the student originates, proposes and executes basic or clinical research. [v-v-v]

MPH 599 Independent Study
The student will undertake a creative project design under the supervision of a faculty member. [v-v-v]

MPH 699 Dissertation Research
Post-candidacy research by arrangement with staff. [v-v-v]

These courses are offered periodically, based on demand:

MPH 571 Physics of Nuclear Medicine II
Covers production of isotopes, radiation detection, pulse height analysis, counting statistics, imaging theory Fourier analysis, scintillation camera, collimation of radiation, image recording, noise analysis, image processing, quality assurance, radiation safety, evaluation of image quality, digital computers in nuclear medicine, dynamic and functional imaging, emission computed tomography, biokinetics and compartmental modeling, and radioimmunoassay. Prerequiste: MPH 471. [3-0-3]

MPH 575 Nuclear Science Techniques as Applied to Biology and Medicine I
Covers radioactivity, measuring devices, production modes; nuclear reactor, cyclotron, generators; radiochemistry, labeling (^{3}H, ^{14}C, ^{125}I); and autoradiography, body counting, NAA. [2-0-2]

MPH 576 Nuclear Science Techniques as Applied to Biology and Medicine II
This course covers: labeling (^{99m}Tc, ^{131}I, ^{75}Se, ^{11}C, ^{13}N, ^{18}F) & Q.C.; tracers for 16 organs; applications in nuclear medicine, therapy, in vitro, hematology; dosimetry; radiation safety; licensing; and FDA. Prerequisite: MPH 575. [2-0-2]

Neurosurgery

NEU 451 Medical Neurobiology
An integrated approach to the central and peripheral nervous system is presented from an anatomic, physiologic and neurochemical standpoint. Based on neuroanatomy, major systems are developed and discussed in terms of anatomic arrangement, physiologic functioning and related synaptic pharmacology. In all systems clinical lectures highlight the practical applications of basic science concepts in patient evaluation and management. [6-3-6] [81 hours]

NEU 501 Introduction to Neuroscience
Physiology of neurons and glia, synaptic processes, sensory receptor physiology, spinal cord, cerebellum and motor control, peripheral mechanisms in sensory systems and higher functions of nervous system. Neuroanatomical concepts correlated to the physiology. Prerequisite: ANA 451. WI [4-0-4]

NEU 511 Techniques in Neuroscience
Graduate students rotate through various faculty members' laboratories and master techniques commonly in use in neuroscience laboratories. [2]

NEU 525 Neuropsychopharmacology
Explores the fundamental pharmacodynamic mechanisms of drugs which act on the central nervous system. Drug classes to be studied will include anesthetic agents, opiopids, antidepressants, and spasmolytics. Each of the ten, two hour lectures will begin with an introduction about a particular disease or disease state, emphasizing the neurobiology of that particular disorder. A detailed description of the mechanism through which a given drug class interacts with that neurobiology to affect its treatment follows. Graduate students taking this class will be expected to perform outside reading that compliments the various lecture topics. Two multiple choice exams will be given. In addition, graduate students taking this course will have to complete a written take-home final. The course is open to all Rush University graduate students who are interested in an in-depth review of the pharmacotherapy of central nervous system disease. [2]

NEU 542 Statistics and Experimental Design for Neuroscience
A two-quarter course covering basic probability and statistical theory. It is not intended to cover all areas of advanced statistical application, but rather to provide the tools for comprehending analytical theory. During the last two weeks of class, guest speakers present examples of their research and statistical analyses.[4-0-4]

NEU 551 Physiology of the Nervous System Function/Dysfunction
An introductory overview of central nervous system disease processes and their treatment. Disease states to be covered include those affecting the neuromuscular junction, the spinal cord, as well as the central nervous system. [4-0-4]

NEU 591 Advanced Neuroscience Proseminar
Taught jointly by participating faculty, seminar format is used to encourage extensive discussion and participation. [6-0-6]

NEU 598 Pre-Dissertation Research
Research credits prior to acceptance to doctoral candidacy. [2 to 6]

NEU 599 Independent Study
Specialized course work designed around the needs of an individual student. [v-v-v]

NEU 681 Neurological Research
Students participate in ongoing research projects within the department. Areas of investigation include neuropharmacology, movement disorders, cerebrovascular disease, sleep disorders, epilepsy, neuromuscular disorders, multiple sclerosis, neurobiology of learning and memory, quantitative neuroimaging, age-related memory disorders and dementia. Participation in an ongoing project of a faculty member is the most practical. Prerequisite: NEU 601. FA WI SP SU [v]

NEU 690 Selected Topics in Neuroscience
Study of contemporary topics in neuroscience. [1 to 4]

NEU 699 Dissertation Research
Research credits after admission to candidacy. [3 to 12]

Nursing (Anesthesia)

NAN 521 Chemistry and Physics in Anesthesia
An introduction to principles of chemistry and physics for nurse anesthesia practice. Major emphasis is on physical chemistry, e.g., states of matter, gas laws, thermodynamics and solutions. [5]

NAN 600 Residency in Anesthesia Nursing
A 52-week, 4-quarter residency following completion of the anesthesia nursing curriculum which provides the opportunity of clinical proficiency in anesthesia practice. Includes journal clubs and conferences. Prerequisite: NUR 531C. [1 credit each quarter]

Nursing

NSG course prefix initiated for undergraduate curriculum since fall quarter 1998. NUR prefix continues for graduate nursing students.

NSG 301 Foundations of Professional Nursing I
This course provides a basic introduction to selected conceptual and psychomotor skills required to provide patient care. The focus is on mastery of basic nursing skills which provide the foundation of patient care across the lifespan. Co-requisite: NSG 301L, NSG 301P, NSG 341, NSG 472, 473 or equivalent. [4]

NSG 301L Foundations Laboratory I
This course provides a basic introduction to selected conceptual and psychomotor skills required to provide patient care. The focus is on mastery of basic nursing skills which provide the foundation of patient care across the lifespan. [2]

NSG 301P Foundations Practicum I
This course provides a basic introduction to selected conceptual and psychomotor skills required to provide patient care. The focus is on mastery of basic nursing skills which provide the foundation of patient care across the lifespan. P/N grade. [2]

NSG 302 Foundations of Professional Nursing II
This course provides an opportunity for the student to understand, identify and apply concepts that are essential to the practice of professional nursing. This course introduces the nursing process and provides the necessary foundation for the integration of biological, psychosocial, behavioral, cultural, and management concepts required to address the patient's basic physiological and psychosocial needs. Prerequisite: Completion of Quarter I Courses; Co-requisite: NSG 302L, 302P, NSG 351 [3]

NSG 302L Foundations Laboratory II
The learning activities of this laboratory will focus on fundamental nursing interventions and basic nursing skills that are critical to nursing practice. All basic nursing skills consist of two components: performance of the skill it self and the theoretical rationale for its performance. Each component is equally important. This integral relationship between performance and understanding cannot be separated. Mastery is obtained through adequate preparation, sufficient practice in the laboratory, and application the clinical setting. The Nursing Therapeutics Laboratory is an integral component of the nursing curriculum. This laboratory experience will provide the nursing student with principles and techniques that cover the life span. [1]

NSG 302P Foundations Practicum II
The purpose of this clinical practicum is to provide the student with the opportunity to intervene with patients' basic physiologic responses to illness through the: (a) practice of basic nursing skills, some of which have been validated in the NTL; and (b) application of concepts of therapeutic interpersonal communication, pathophysiology, health assessment, pharmacology, and the nursing process. P/N grade. [2]

NSG 302 Foundations of Professional Nursing II (4q)
This course provides an opportunity for the student to understand, identify and aaply concepts that are essential to the practice of professional nursing. This course introduces the nursing process and provides the necessary foundation for the integration of biological, psychosocial, behavioral, cultural, and management concepts required to address the patient's basic physiological and psychosocial needs. Co-requisite: NSG 302L, NSG 302P and full-time enrollment in the 4-quarter program. [3]

NSG 302L-Lab (4q)
The learning activities of this laboratory will focus on fundamental nursing interventions and basic nursing skills that are critical to nursing practice. All basic nursing skills consist of two components: performance of the skill itself and the theoretical rationale for its performance. Each component is equally important. This integral relationship between performance and understanding cannot be separated. Mastery is obtained through adequate preparation, sufficient practice in the laboratory, and application the clinical setting. The Nursing Therapeutics Laboratory is an integral component of the nursing curriculum. This laboratory experience will provide the nursing student with principles and techniques that cover the life span. [3]

NSG 302P-Practicum (4q)
The purpose of the NSG 302P clinical practicum is to provide the student with the opportunity to intervene with patients' basic physiologic responses to illness through the: (a) practice of basic nursing skills, some of which have been validated in the NTL; and (b) application of concepts of therapeutic interpersonal communication, pathophysiology, health assessment, pharmacology, and the nursing process. P/N grade. [2]

NSG 305 Health Assessment
The course will include the elements of a comprehensive multidimensional assessment. Cross-cultural communication principles will be emphasized. Students will practice assessment skills in a simulated clinical situation. They will be expected to use learned skills during the foundations of nursing practicum. Prerequisite: Completion of quarter 1 courses or equivalent. Co-requisite: NSG 305L. [3]

NSG 305L Health Assessment Laboratory
The course will include the elements of a comprehensive multidimensional assessment. Cross-cultural communication principles will be emphasized. Students will practice assessment skills in a simulated clinical situation. They will be expected to use learned skills during the foundations of nursing practicum. [1]

NSG 305 Health Assessment (4q)
The course will include the elements of a comprehensive multidimensional assessment. Cross-cultural communication principles will be emphasized. Students will practice assessment skills in a simulated clinical situation. They will be expected to use learned skills during the foundations of nursing practicum. Co-requisite: NSG 305L and full-time enrollment in the 4-quarter program. [2]

NSG 305-Lab (4q)
The course will include the elements of a comprehensive multidimensional assessment. Cross-cultural communication principles will be emphasized. Students will practice assessment skills in a simulated clinical situation. They will be expected to use learned skills during the foundations of nursing practicum. [1]

NSG 331 Introduction to Human Disease
Basic general survey course that focuses on the development of selected disease states associated with significant morbidity and mortality in the United States. Underlying pathological concepts, including cell/injury and death, inflammation, genetic alteration, immune dysfunction, and neoplasia, are discussed at the cellular level; however, the emphasis is on organ and system level pathophysiology. The course is intended for non-nurses who need a basic understanding of major disease states to inform their field of study. [4]

NSG 341 Basic Pathology
Course provides conceptual approach to alterations in normal anatomic structure and function. General and system specific concepts related to causation and clinical manifestations of pathology across the life span are discussed. Prototype illnesses are used to illustrate pathologic concepts. An understanding of normal anatomy and physiology is essential for success. A review of normal structure and function prior to class attendance is strongly recommended. [4]

NSG 341 Basic Pathophysiology (4q)
This course will provide a conceptual approach to alterations in normal anatomic structure and function. General and system specific concepts related to the causation and clinical presentation of pathology will be discussed. Prototype diseases will be used to illustrate pathologic concepts. An understanding of normal anatomy and physiology is essential for success NSG 341. A review of normal structure and function prior to class attendance is strongly recommended. Co-requisite: full-time enrollment in the 4-quarter program. [3]

NSG 351 Introduction to Nursing Pharmacology (4q/7q)
This course provides a comprehensive approach to the principles and practice of pharmacology as applied to the nursing process. Prototypical agents are used in discussion or indication, mechanism of action, dosage, adverse effects, drug interaction, and nursing implications. An understanding of key physiologic and pathophysiologic content is essential for success in NSG 351. Prerequisites: NSG 341 or permission of instructor or co-requisites: full-time enrollment in the 4-quarter program. [4]

NSG 382 Nursing Research
Introduction to the role of research in professional nursing practice. Topics include: basic concepts of the research process, criteria for evaluating research reports, and the use of research in practice. Selected research literature and resources are critically appraised. Offered as online web-based section for BSN completion students only. Prerequisite: NSG 302, NSG 302L, NSG 302P or RN Licensure or permission of instructor. [4]

NSG 383 Research (4q)
Introduction to the role of research in professional nursing practice. Topics include: basic concepts of the research process, criteria for evaluating research reports, and the use of research in practice. Selected research literature and resources are critically appraised. Prerequisite: Successful completion of all tier I courses and full-time enrollment in the 4-quarter program. [2]

NSG 400 Concepts for Professional Nursing
This web-based course is designed to guide the BSN completion student in the application, integration, and analysis of selected concepts and theories of professional nursing. The course explores topics and issues that will enable the student to perform successfully in upper division nursing courses. Verbal, written communication, and critical thinking skills are further developed through class assignments. Tools designed to assess and enhance current clinical skills and knowledge are also utilized. Prerequisite: RN Licensure or permission of instructor. [5]

NSG 401 Nursing Care of the Individual
Focus on nursing therapeutics and standards of care related to selected common acute and chronic health problems of the adult client. Emphasis is on the integration of pathophysiology, pharmacology, health assessment and nursing therapeutics. Prerequisite: Completion of all Tier I courses. Co-requisite: NSG 401P. [4]

NSG 401P Nursing Care of the Individual Practicum I
This course offers clinical experiences in the nursing management of hospitalized adults with common acute and chronic health problems. Emphasis is on the integration of pathophysiology, pharmacology, health assessment and nursing therapeutics. P/N grade. [5]

NSG 401 Care of the Adult I (4q)
This course will focus on the nursing and medical management of adults with common acute and chronic health problems. Emphasis is on the integration of pathophysiology, pharmacology, health assessment and nursing therapeutics. Prerequisite: All Tier I courses and full-time enrollment in the 4-quarter program. Co-requisite: NSG 401L, NSG 401P. [4]

NSG 401L Lab (4q)
The learning activities of this laboratory will focus on fundamental nursing interventions and basic nursing skills that are critical to nursing practice. All basic nursing skills consist of two components: performance of the skill it self and the theoretical rationale for its performance. Each component is equally important. This integral relationship between performance and understanding cannot be separated. Mastery is obtained through adequate preparation, sufficient practice in the laboratory, and application the clinical setting. The Nursing Therapeutics Laboratory is an integral component of the nursing curriculum. This laboratory experience will provide the nursing student with principles and techniques that cover the life span. [1]

NSG 401P Practicum (4q)
This course offers clinical experiences in the nursing management of hospitalized adults with common acute and chronic health problems. Emphasis is on the integration of pathophysiology, pharmacology, health assessment and nursing therapeutics. [5]

NSG 402 Nursing Care of the Individual II
Course will examine the etiology, manifestations and clinical management of selected mental illnesses across the lifespan. Emphasis will be on the integration of multidisciplinary knowledge and the application of nursing skill to promote optimal functioning and rehabilitation of the individual with mental illness. Prerequisite: NSG 401, 401P. Co-requisite: NSG 402P. [5]

NSG 402P Nursing Care of the Individual Practicum II
Course will examine the etiology, manifestations and clinical management of selected mental illnesses across the lifespan. Emphasis will be on the integration of multidisciplinary knowledge and the application of nursing skill to promote optimal functioning and rehabilitation of the individual with mental illness. P/N grade. [4]

NSG 402 Care of Adult II (4q)
Course will examine the etiology, manifestations and clinical management of selected mental illnesses across the lifespan. Emphasis will be on the integration of multidisciplinary knowledge and the application of nursing skill to promote optimal functioning and rehabilitation of the individual with mental illness. Co-requisite: NSG 402P. [3]

NSG 402 Practicum (4q)
Course will examine the etiology, manifestations and clinical management of selected mental illnesses across the lifespan. Emphasis will be on the integration of multidisciplinary knowledge and the application of nursing skill to promote optimal functioning and rehabilitation of the individual with mental illness. P/N grade. [3]

NSG 403 Nursing Care of the Family
This course will examine the family in childbearing and child rearing from birth to adolescence, health and illness. Health maintenance and promotion are integrated throughout the course. Content specific to current maternal-child health issues is also included. Co-requisite: NSG 403P. [7]

NSG 403P Nursing Care of the Family Practicum
This course is the associated clinical experience for NSG 403. Students will apply family theory, assess, and intervene during the phases of childbearing and childrearing in at least two clinical practice settings. Students will integrate health promotion and health maintenance when teaching and developing plans of care for pregnant women, infants, and children. P/N grade. [5]

NSG 403 Nursing Care of the Family (4q)
Family theory, assessment and intervention during the phases of child bearing and child rearing will be studied. Health maintenance and promotion with an emphasis on the pregnant woman, infants and children will be integrated throughout the course. Maternity nursing content will focus on the care of women and their families through pregnancy labor, delivery and the post partum period. The physiology pathophysiology, assessment and intervention for common health problems in children ages birth through adolescence will also be studied.

NSG 403P Nursing Care of the Family Practicum (4q)
Family theory, assessment and intervention during the phases of child bearing and child rearing will be applied in at least two clinical practice settings. Health maintenance and promotion with an emphasis on the pregnant woman, infants and children will be integrated in care plans and teaching. Obstetric experiences will include the care of women and their families through pregnancy, labor, delivery and the postpartum period. The physiology, pathophysiology, assessment and intervention for common health problems in children ages birth through adolescence will also be applied in pediatric settings.

NSG 404 Community Health Nursing
The theoretical foundation for the nursing care of individuals, families, and aggregates in the community is explored. The focus is on applying the nursing process to communities and populations at risk as well as those manifesting physical, social, mental, and other health deviations. Nursing roles in the promotion of health, prevention of illness, and the treatment of health problems of target groups is examined. Offered as online web-based section for BSN completion students only. Prerequisite: Successful completion of Tier II courses. Co-requisite: NSG 404P. [3]

NSG 404P Community Health Nursing Practicum
This clinical course applies the nursing process to an aggregate or community. Students develop skills in cultural competence and appreciation, community collaboration, application of the levels of prevention to nursing activities, and working in teams. P/N grade. [2]

NSG 404/RN Community Health Nursing for BSN Completion Students
This three quarter-hour course, designed for the BSN Completion student, synthesizes nursing and public health theory to explore the nursing care of individuals, families, and aggregates in the community. The focus is on applying the nursing process to communities and populations at risk as well as exploring physical, social, environmental, and cultural factors that impact the health of groups. Community nursing roles in the promotion of health, prevention of illness, reduction of risk, and the treatment of health problems are discussed. Prerequisite: NSG 400. Co-requisite: NSG 404P RN. [3]

NSG 404P/RN Community Health Nursing for BSN Completion Students Practicum
This clinical course designed for the BSN Completion student, consists of a series of application activities to enable the student to apply the theory learned in NSG 404. To complete the clinical objectives, students will be guided in the selection of a local community with which to work. Students will interact with the faculty member weekly for direction and problem solving. Prerequisites: NSG 341 and NSG 351. Co-requisites: NSG 404RN [3]

NSG 405 Home Health/Hospice Nursing
Focus of course is on nursing care of patients and related issues in the home care and hospice settings. Impact of current issues and historic trends on home and hospice practice are examined, including interdisciplinary team collaboration, case management, standards of care, ethical issues, and resource constraints. Issues of aging and chronicity in relationship to home care practice will be addressed. Offered as online web-based section for BSN completion students only. Prerequisite: Successful completion of Tier II courses or NSG 400. Co-requisite: NSG 405P. [2]

NSG 405P Home Health/Hospice Nursing Practicum
This course explores nursing care, current trends and issues of aging and chronicity in home health and hospice. Students will examine nursing roles and responsibilities in patient care in the home, case management, and interdisciplinary teams. P/N grade. [4]

NSG 405P/RN Home Health/Hospice Nursing Practicum for BSN Completion Students
To successfully complete the clinical objectives, students will be guided in activities that focus on care of indivudals in the home setting that is related to home care and hospice issues. Students will interact with the faulty member weekly as they work through the practicum course activities. Prerequisite: NSG 341, NSG 351, NSG 400. Co-requisite: NSG 405/RN. [3]

NSG 405/RN Home Health/Hospice Nursing for BSN Completion Students Practicum
This course explores nursing care, current trends and issues of aging and chronicity in home health and hospice. Students will examine nursing roles and responsibilities in patient care in the home, case management, and interdisciplinary teams. Prerequisites: NSG 341, NSG 351, NSG 400. Co-requisite: NSG 405P RN. [3]

NSG 406 Nursing Leadership and Management in Clinical Practice
The focus of this course is to develop a knowledge base necessary to apply leadership and management concepts, principles, theories and strategies in Nursing Practice. As part of this course you will complete a paper about a leadership/management issue. The paper is an integrated experience that requires you to apply theories of management and leadership in the clinical setting and communicate your findings in a scholarly paper. Prerequisite: Successful completion of all tier II courses. Co-requisite: NSG 406L, NSG 406P.

NSG 406L Leadership and Management in Clinical Practice Laboratory
The course is designed to assist the student to describe and recognize common cardiac rhythm disturbances. Content covered also includes cardiac anatomy and physiology, arrhythmogenesis, electrophysiology, and clinical implications of rhythm disturbances. [1]

NSG 406P Leadership/Management in Clinical Practice Practicum
The focus of this course is to develop the knowledge base necessary to apply leadership and management concepts, principles, theories and strategies in Nursing Practice. The course also deals with issues related to the role of the professional nurse and strategies for effective transition to the professional role of the nurse. As part of this course your will complete a scholarly paper about a leadership and management issue. The paper is an integrated experience that requires application of theories of management and leadership to a clinical practice setting. P/N grade. [8]

NSG 406P/RN Nursing Leadership and Management in Clinical Practice
To complete the clinical objectives, students will be guided in the selection of clinical experiences and sites by a faculty member. The faculty member will also interact with the students weekly to provide direction and problem solving. (Practicum). Prerequisite: NSG 400. Co-requisite: NSG 406/P.

NSG 406/RN Nursing Leadership and Management in the Delivery of Care
The focus of this course is to develop a knowledge base necessary to apply leadership and management concepts, principles, theories and strategies in Nursing Practice. As part of this course you will complete a paper about a leadership/management issue. The paper is an integrated experience that requires you to apply theories of management and leadership in the clinical setting and communicate your findings in a scholarly paper. Prerequisite: NUR 341, NSG 351, NSG 400. Co-requisite: 406P. [2]

NSG 406 Nursing Leadership and Management in the Delivery of Complex Patient Care
The focus of this course is the integration of nursing leadership and management principles into the management of complex clients in the acute care environment. Blending theory and clinical practice, the student will manage client care with competence and confidence. Prerequisite: Successful completion of all Tier III courses.

NSG 406P Role Transition Practicum (4q)
This intensive clinical experience will partner a student with an experienced nurse mentor. The focus of the clinical experience is on managing a caseload of patients, delegation and management responsibilities of the staff nurse. Prerequisite: Successful completion of all Tier III courses. P/N grade. [4]

NSG 407 Complex Care (4q)
Course will integrate pathophysiology, technology and nursing practice of complex, Acutely ill patients and their families throughout the life cycle. The social, psychological and economic impact of complex care will be presented. Prerequisite: All Tier II Courses. Co-requisite: NSG 407L, 407P and full time enrollment in the 4-quarter program. [2]

NSG 407L Complex Care Laboratory (4q)
The learning activities of this laboratory will focus on fundamental nursing interventions and basic nursing skills that are critical to nursing practice. All basic nursing skills consist of two components: performance of the skill it self and the theoretical rationale for its performance. Each component is equally important. This integral relationship between performance and understanding cannot be separated. Mastery is obtained through adequate preparation, sufficient practice in the laboratory, and application the clinical setting. The Nursing Therapeutics Laboratory is an integral component of the nursing curriculum. This laboratory experience will provide the nursing student with principles and techniques that cover the life span. [1]

NSG 407P Complex Care Practicum (4q)
The purpose of NSG 407P clinical practicum is to provide the student with the opportunity to integrate nursing principles into the management of complex, acutely ill patients and their families. Emphasis is on the integration of pathophysiology, pharmacology, assessment and nursing therapeutics. P/N grade. [4]

NSG 411 Community/Home Health Hospice (4q)
This course synthesizes nursing and public health theory to explore the nursing care of individuals, families, and aggregates in the home and community settings. Application of the nursing process as well as examination of the social, environmental, and cultural factors that impact health are addressed. Nursing roles in the promotion of health, prevention of illness, reduction of risk, treatment of health problems, collaboration with others, and end-of-life care are examined. Prerequisite: Successful completion of all Tier II courses. Co-requisite: NSG 411P. [4]

NSG 411P Community/Home Health Hospice Practicum (4q)
This community-based and population-focused clinical course applies theory and research to the nursing care of individuals, families, and aggregates. Students utilize the nursing process in activities that support the promotion of health, prevention of illness, reduction of risk, treatment of health problems, and end-of-life care. P/N grade. Co-requisite: NSG 411. [4]

NSG 413 Nursing Care of the Individual III
This course examines the etiology, manifestations and clinical management of selected chronic physical illnesses, disabilities and common health problems of the older adult. Implications of physiologic and psychosocial adaptations across the life span are also examined. Emphasis is placed on the integration of interdisciplinary knowledge and the application of nursing skills to promote optimal functioning of the aged adult across the continuum of care. Co-requisite: NSG 413P. [2]

NSG 413P Nursing Care of the Individual III
This course examines the etiology, manifestations and clinical management of selected chronic physical illnesses and disabilities and common health problems of the older adult. Implications of physiologic and psychosocial adaptations across the lifespan are also examined. Emphasis is placed on the integration of interdisciplinary knowledge and the application of nursing skills to promote optimal functioning of the aged adult across the continuum of care. P/N grade. [3]

NSG 413 Nursing Care of the Individual III (4q)
The course will examine etiology, manifestations and clinical management of selected chronic physical illnesses, disabilities, and common health concerns of the older adult. Implications of physiologic and psychosocial adaptations across the lifespan are also examined. Emphasis is placed on the integration of interdisciplinary knowledge and the application of nursing sills to promote optional functioning of the aged adult across the continuum of care. Co-requisite: NSG 413P and full-time enrollment in the 4-quarter program. [2]

NSG 413P-Practicum (4q)
The course will examine etiology, manifestations and clinical management of selected chronic physical illnesses, disabilities, and common health concerns of the older adult. Implications of physiologic and psychosocial adaptations across the lifespan are also examined. Emphasis is placed on the integration of interdisciplinary knowledge and the application of nursing sills to promote optional functioning of the aged adult across the continuum of care. P/N grade. [3]

NSG 423 Intraoperative Nursing
Focus is on intraoperative phase of patient care. Prerequisite: NSG 302, NSG 302L, NSG 302P. [2]

NSG 423P Intraoperative Nursing Practicum
Co-requisite: NSG 423. [2]

NSG 431 Nurse and Society I
Nurse and Society I is the first in a series of three web based courses. They are designed to facilitate professional role development. The concepts of ethics, communication, human diversity and caring will be analyzed and applied to clinical practice situations. Nurse and Society I will focus on beginning professional socialization, role development, collegial communication, cultural applications and the concept of caring. Prerequisite: Successful completion of all Tier I courses. Co-requisite: registration with a clinical course. [1]

NSG 432 Nurse and Society II
This series of web-based one-hour courses facilitates professional role development. The concepts of ethics, communication, human diversity and caring will be analyzed and applied to clinical practice situations. Specifically, NSG 432W focuses on ethical issues affecting professional nursing and healthcare. This web-based course utilizes an asynchronous format. The course is organized by weeks. Prerequisite: Successful completion of all Tier II courses. Co-requisite: registration with a clinical course. [1]

NSG 433 Nurse and Society III
Nurse and Society III is the third in a series of on-line courses to facilitate your professional role development. The focus of this course is the role of the professional nurse in managing care within the current political, social and economic health care environment. A nursing case management framework will be used with emphasis on interdisciplinary collaborative communication. The benefits to patients when care is based on practice standards, multidisciplinary planning, quality monitoring and outcome evaluation will be examined. Prerequisite: Successful completion of all Tier II courses. Co-requisite: registration with a clinical course.

NSG 436 Nutrition (4q)
This course is organized into two parts. Part I examines nutrition for health promotion, including guidelines for healthy eating, cultural/ethnic/social influences on food habits, alternative diets and food supplements, nutrition assessment, and nutrition throughout the life cycle. In Part 2, nutrition therapy for malnutrition and common childhood, chronic, and acute disorders, as well as nutrition support techniques are appraised. Prerequisite: Successful completion of all Tier I courses and full-time enrollment in the 4-quarter program. [1]

NSG 437 The Impact of Culture and Ethics on Nursing Care (4q)
This web-based course will focus on the ethical, legal, political values and socio-cultural and economic issues and trends affecting professional nursing health care. Prerequisite: Successful completion of all Tier I courses and full-time enrollment in the 4-quarter program. [1]

NSG 438 Health Promotion and Community Assessment (4q)
This course provides foundational content to the nursing care of populations through study of theory and research related to promoting health, preventing disease, examining health risks throughout the lifespan, and assessing groups and aggregates. Prerequisite: Successful completion of all Tier I courses and full-time enrollment if the 4-quarter program. [1]

NSG 441 Independent Clinical Study
Intensive independent study in a clinical nursing area. [v]

NSG 449 Independent Study
Student contracts with nursing faculty for independent academic study in an area of nursing. [v]

NSG 472 Introduction to Normal and Clinical Nutrition
Introduction to nutrition and its relationship to health and illness. Topics include nutrition guidelines, food habits, complementary nutrition therapies, essential nutrients, assessment of nutritional status, nutrition needs across the life span, obesity and eating disorders, nutrition for athletic performance, and nutrition management of special populations [2]

NSG 473 Therapeutic Nutrition
This 5 week course is designed for undergraduate nursing students. Other undergraduate students and graduate nursing students may also register for the course. The focus of the course is nutrition in clinical care. Topics include therapeutic diets; nutritional management of gastrointestinal and cardiovascular disorders, diabetes, HIV/AIDS, and cancer; end-of-life nutrition care; and specialized nutrition support techniques. Prerequisite: Permission of instructor. [1]

NUR 501A Theoretical Foundations for Advanced Practice
Application and evaluation of theories and frameworks to nursing advanced practice. Course include psychosocial and physiologic theories as well as ethical frameworks. [2]

NUR 502A Issues in APN Role Development
This course is designed to provide an overview of Advanced Practice Nursing (APN) roles in the current healthcare marketplace. The course will address the context in which APN's practice, including the organization of health care delivery systems, economics of managed care and health policy. Students will be able to describe a model of APN practice along with core competencies and identify strategies to support and promote APN practice. [2]

NUR 502B Transition to the APN Role
This is the second course in a two part series dealing with issues transitioning into APN practice. The course focuses on management, organization, regulatory and reimbursement issues necessary for entering into a first position as an APN in the current marketplace. Prerequisite: NUR 502A and a minimum of 6 hours of NUR 541. [2]

NUR 502C Transition to the CRNA Role
Prerequisites: NUR 502A and a minimum of 6 hrs. of NUR 541.

NUR 503 Physical Diagnosis: Assessment and Evaluation Across the Lifespan
This is a course designed to enhance the student's knowledge of physical assessment and the diagnosis of physical findings through both didactic and clinical methods. Students are introduced to clinical problem-solving. The content is organized around the health assessment of patients across the lifespan. Pre-requisites: Basic Physical Assessment course, RN licensure and admission to the College of Nursing. Prerequisite or co-requisite: PPH 512 and PHY 551. [4]

NUR 503A Neonatal Assessment and Diagnosis
The course focuses on the knowledge and skills necessary to perform comprehensive assessment of neonates and infant through the first year of life. Systematic data collection and interpretation, diagnostic reasoning, and clinical problem solving for a variety of neonates from the very low birth with preterm to the health infant is emphasized along with developing clinical proficiency. Content will include Perinatal history taking, assessment of fetal well-being, neonatal physical examination, gestation age assessment, neurobehavioral assessment, and the use of diagnostic tests/tools such as radiographics, instrumentation, monitoring devices, etc. Prerequiste: Basic physical assessment course, RN licensure and admission to the College of Nursing. Prerequisite and co-requisite: PHY 551, PPH 512 and NUR 527. [3]

NUR 505 Diagnostics for the Advanced Practice Nurse
This course has been developed to prepare the advanced practice nurse for the use, interpretation, and application of laboratory and diagnostic techniques and procedures. The student will interpret data to develop critical thinking and decision-making skills in specialty areas of practice across the lifespan. Prerequisite or co-requisite: PPH 512 and PHY 551. [3]

NUR 510 Biostatistics
This web-based course is a basic introduction to the use of statistics for nurses in the field of health sciences. Topics include sampling distributions, estimation, t-tests, chi-square, one-way analysis of variance and non-parametric statistics. Students will be required to do statistical computation on the computer and must have SPSS available. [3/4]

NUR 511 Basic Concepts in Human Lactation and Breastfeeding
This course will use a critical thinking approach to examine concepts and management strategies pertinent to human lactation and breastfeeding process. Students will integrate the concepts of cultural diversity, nutrition, medication, maternal and fetal health, and consumerism in the process. Course content provides a foundation for promotion and support of breastfeeding for the undergraduate, graduate and unclassified student in neonatal, pediatric and obstetrical nursing. [2]

NUR 520 Case Management Across the Health Care Continuum
This course is designed to provide an overview of the evolution case management and analyze contemporary models across the health care continuum. The roles and responsibilities of the case manager will be discussed. A major focus is to identify strategies that promote appropriate clinical outcomes of care and cost-efficient utilization of resources. [2]

NUR 521A Research for Advanced Practice
Research studies are analyzed and evaluated relative to an identified clinical problem. Includes concepts, methods, and strategies inherent to the research process with a focus on design, internal and external validity, sampling, measurement and ethical issues. Prerequisite: NUR 510 or equivalent and pre- or co-requisite: NUR 501A. [3]

NUR 522 Health Promotion and Disease Prevention in Diverse Populations
This course is designed to provide students with knowledge enabling them to assess diverse populations and discuss the major biological and psychosocial health problems in terms of risk and prevention. Students will be able to describe broad constructs of health promotion and steps for initiating and evaluating programs that address health problems of national and local concern, including attention to cultural sensitivity. [3]

NUR 527 Developmental Physiology of the Fetus/Neonate
This course is designed to provide the student with greater depth of understanding of developmental physiology of the fetus and neonate. Principles of growth and development, genetics/teratogenesis, embryology, and maturation of organ systems as related to critical periods of intrauterine development, transition to extrauterine life, and through early infancy will be covered. Adaptation to physiologic stress and alterations from normal will also be discussed. [3]

NUR 529 Pharmacology
This course covers the principles of pharmacokinetics and pharmacodynamics. The course is designed to provide the foundational knowledge requisite to understanding pharmacotherapeutics. Prerequiste: PHY 551, PPH 512. [3]

NUR 530B Applied Pharmacology in Advanced Practice Nursing: Neonatal Pharmacotherapeutics
This course provides the student with a greater depth of understanding of neonatal pharmacology. Content focuses on the alterations seen in the principles of pharmacokinetics and pharmacodynamics when applied to neonatal physiology, special considerations of drug therapy in the neonate, and advanced nursing management of selected neonatal therapeutics. Issues associated with drug therapy in the neonatal intensive care unit such as evaluation of experimental agents are also included. The course, in conjunction with NUR 529, will meet statutory requirements for prescriptive authority for advanced nursing practice. Prerequisite: NUR 529. [3]

NUR 530C Psychopharmacology
Course provides advanced practice nurse with knowledge of pharmacotherapeutics for common acute and chronic health conditions across the lifespan. Building on the student's knowledge of pharmacokinetics and pharmacodynamics, content includes medications used for the diagnosis and treatment of a variety of physical and psychiatric disorders and monitoring the physical, behavioral and psychiatric responses to such interventions. The course is offered in sections according to specialty area of practice. Prerequisite: NUR 529. [3]

NUR 530D Pharmacotherapeutics in Acute Care
Course provides advanced practice nurse with knowledge of pharmacotherapeutics for common acute and chronic health conditions across the lifespan. Building on the student's knowledge of pharmacokinetics and pharmacodynamics, content includes medications used for the diagnosis and treatment of a variety of physical and psychiatric disorders and monitoring the physical, behavioral and psychiatric responses to such interventions. The course is offered in sections according to specialty area of practice. Prerequisite: NUR 529. [3]

NUR 530E Pharmacotherapeutics in Primary Care
Course provides advanced practice nurse with knowledge of pharmacotherapeutics for common acute and chronic health conditions across the lifespan. Building on the student's knowledge of pharmacokinetics and pharmacodynamics, content includes medications used for the diagnosis and treatment of a variety of physical and psychiatric disorders and monitoring the physical, behavioral and psychiatric responses to such interventions. The course is offered in sections according to specialty area of practice. Prerequisite: NUR 529. [3]

NUR 530F Pharmacotherapeutics I
This course focuses on the pharmacokinetics and pharmacodynamics of anesthetic agents and adjunctive drugs. The interactions between anesthetics and other pharmacological substances will be discussed. Prerequisitie: NUR 529. [2]

NUR 530G Pharmacotherapeutics II
This course is designed to be a comprehensive study of the pharmacokinetics and pharmacodynamics involved with the administration of anesthesia. The interactions between anesthetics and other pharmacological substances will be discussed. The effects of the aging process and varying degrees of pathophysiology on the pharmacokinetics and pharmacodynamics of anesthesia will also be studied. Prerequisite: NUR 529, 530F. [4]

NUR 530H Pharmacotherapeutics in Pediatrics
Course provides advanced practice with nurse with knowledge of pharmacotherapeutics for common acute and chronic health conditions in the care of pediatric patients. Prerequisite: NUR 529. [3]

NUR 531-536 Clinical Seminars in Master of Science Nursing Practice
A matrix of nursing courses that allows concentrated study in a specialized area of nursing practice at master's level.

NUR 531A Basic Principles of Anesthesia Nursing
Principles and skills basic to the practice of anesthesia nursing are discussed. Focus is on patient assessment and planning care. Prerequisite: NAN 521 and Co-requisite: NUR 541. [3]

NUR 531B Advanced Principles of Nursing Anesthesia Care
Anesthesia principles related to surgical specialties and perioperative management discussed with emphasis upon understanding anatomic, physiologic/pathologic principles, and use of pharmacologic intervention. Prerequisite: NUR 530F, 531A and Co-requisite: NUR 541. [3]

NUR 531C Anesthesia Nursing Care of the Pediatric and Obstetrical Patient
Anesthesia related to the specialty areas of pediatrics and obstetrics is discussed. Specific assessment and planning skills needed for these patient groups are highlighted. Prerequisite: NUR 531B and Co-requisite: NUR 541 [3]

NUR 532A Basic Concepts/Methods of Community Health
Introduction to concepts and methods of assessing health status among community groups is presented. Theories and epidemiological frameworks are incorporated into the health assessment of groups and populations. Pre- or co-requisite: NUR 575 and co-requisite: NUR 541. [3]

NUR 532B Community Health Implementation and Evaluation
Theoretical frameworks are used for the diagnosis of and planning for data based community health problems. Prerequisite: NUR 532A. [2]

NUR 532J Family Nurse Practitioner in Primary Health Care I
Focuses on primary health care clinical judgement, including concepts of health maintenance, health promotion, disease prevention and risk appraisal across the life span for diverse clients. Course emphasizes pediatric primary care. (3) Prerequisite: NUR 503, NUR 505. Co-requisite: NUR 541 and pre- or co-requisite: NUR 530E

NUR 532K Family Nurse Practitioner in Primary Health Care II
Focuses on primary health care clinical judgement, including concepts of health maintenance, health promotion, disease prevention and risk appraisal across the life span for diverse clients. Course emphasizes women's health. Prerequisite: NUR 532J and co-requisite: NUR 541. [3]

NUR 532L Family Nurse Practitioner in Primary Health Care III
Focuses on primary health care clinical judgement, including concepts of health maintenance, health promotion, disease prevention and risk appraisal across the life span for diverse clients. Course emphasizes adult health. Prerequisite: NUR 532K and co-requisite: NUR 541. [3]

NUR 532M Family Nurse Practitioner in Primary Health Care IV
Focuses on primary health care clinical judgement, including concepts of health maintenance, health promotion, disease prevention and risk appraisal across the life span for diverse clients. Course continues emphasis on adult health. Prerequisite: NUR 532L and co-requisite: NUR 541. [3]

NUR 533A Advanced Practice in Maternal Child Nursing
A critical thinking approach is used to examine concepts and theories pertinent to maternal-child nursing. Students will analyze issues, such as attachment, chronic illness, chronic sorrow, etc. Course content provides the foundation for advanced practice in neonatal, pediatric and women's health nursing. Prerequisite: NUR 521. [3]

NUR 533F Advanced Primary Care of the Child I
The course focus is on the development of critical thinking and clinical judgment in pediatric primary care. A chronological approach is used to address preventive health care services, and the identification and management of common health problems found in infants, children and adolescents. Prerequisite: NUR 503, NUR 505, NUR 533A. Co-requisite: NUR 541. Pre- or co-requisite: NUR 530H. [3]

NUR 533G Advanced Primary Care of the Child II
The course content provides the theoretical basis for clinical judgment and decision making skills for providing primary care to ill children and their families. A systems approach is used to focus on assessment and management of acute and chronic health problems. Prerequisite: NUR 533F and co-requisite: NUR 541. [3]

NUR 533H Advanced Primary Care of the Child III
The course enhances the clinical judgment and decision making required in providing primary care to children with complex physical and psychosocial needs. A systems approach is used to focus on assessment and management of complex health problems. Prerequisite: NUR 533G and co-requisite: NUR 541. [3]

NUR 533N Neonatal Management I: High Risk Family
Course introduces the role of the NNP in the management of normal and high-risk families and their infants. The focus of the course is on development of a conceptual framework for neonatal advanced practice nursing with childbearing families and their newborns. The development of skills in the assessment and management of families with high-risk neonates during all phases of the childbearing process (antenatal, intrapartum, post-partum and the neonatal periods). Prerequisite: NUR 503A and co-requisite: NUR 541. [3]

NUR 533P Neonatal Management II: High Risk Neonate
Continuation of NUR 533N. Focus on the assessment, pathophysiology, stabilization and management of high-risk neonates with problems of low to moderate acuity. Role of skills such as intubation, thoracentesis, tube thoracotomy, lumbar puncture, suprapubic bladder aspiration, percutaneous central venous catheter insertion, umbilical vessel catherization, and peripheral arterial line insertion are included. Ethical issues and care of the family in crisis are also emphasized. Prerequisite: NUR 533N and co-requisite: NUR 541. [3]

NUR 533Q Neonatal Management III: Critically Ill Neonate
This course provides the student with the theoretical and practical knowledge needed for the role of the NNP in the neonatal intensive care unit (NICU). Content will focus on the assessment, pathophysiology, stabilization and management of critically ill neonates (high acuity). Prerequisite: NUR 533P and co-requisite: NUR 541. [3]

NUR 533R Pediatric Acute/Chronic Care
Advanced Acute/Chronic Care Management of the Pediatric Patient focuses on the recognition and management of major health problems and complications as they affect selected organ systems in the pediatric patient and their family. Utilization of diagnostic modalities and the development of advanced nursing intervention strategies are emphasized. Clinical decision-making and critical thinking provide the framework for the development and implementation of treatment plans. The courses NUR 533R/S are designed to be taken concurrently with NUR 541 Master's Practica and NUR 548 Master's Capstone Project. Prerequisite: NUR 533F and co-requisite: NUR 541. [3]

NUR 533S Advanced Acute/Chronic Care Management of the Pediatric Patient II
This course focuses on the recognition and management of major health problems and complications as they affect selected organ systems in the pediatric patient and their family. Utilization of diagnostic modalities and the development of advanced nursing intervention strategies are emphasized. Clinical decision-making and critical thinking provide the framework for the development and implementation of treatment plans. The courses NUR 533R/S are designed to be taken concurrently with NUR 541 Master's Practica and NUR 548 Master's Capstone Project. Prerequisite: NUR 533R, NUR 533F and co-requisite: NUR 541. [3]

NUR 534B Nursing Care of the Critically Ill Patient
Concepts from basic and applied sciences of critical care nursing and research-based strategies for implementation are applied to critically ill population of all age groups. Prerequisite: NUR 534S. [4]

NUR 534R Management of the Adult Patient I: Acute & Chronic Illness I
Recognition and management of selected common acute and chronic health care problems in the adult. Special emphasis on women's health care issues seen in primary care. Prevention, screening, diagnosis, treatment, and counseling adult patients form the framework for students to refine clinical decision-making and critical thinking skills. Illness management, health promotion, and risk reduction are integrated into the assessment and management plans for adult patients. Prerequisite: NUR 503, 529, co-requisite: NUR 541 and pre- or co-requisites: NUR 505, PHY 552, PPH 511. [4]

NUR 534S Management of the Adult Patient II: Acute & Chronic Illness II
The focus is on the recognition and management of selected common acute and chronic health care problems in the adult. A special emphasis will be on women's health care issues seen in primary care. Prevention, screening, diagnosis, treatment, and counseling adult patients form the framework for students to refine clinical decision-making and critical thinking skills. Illness management, health promotion, and risk reduction are integrated into the assessment and management plans for adult patients. Prerequisite: NUR 534R. [4]

NUR 534T Management of the Adult Patient: Women's Health
Examines adult women's health in primary care. Emphasis on primary care management of common health problems and psychosocial/cultural issues of adult women. Prerequisite: NUR 534S. [2]

NUR 534V Management of the Adult Patient: Frail Elderly
Assessment and nursing management of healthy/frail elderly to promote, maintain, and restore optimal functioning. [3]

NUR 535A Assessment and Evaluation in Delivery of Mental Health Services
This course will focus on the interview as a method for gathering pertinent data in order to conduct a diagnostic evaluation and make appropriate treatment recommendations with clients exhibiting psychiatric symptoms. Prerequisite: BHV 528. [4]

NUR 535B Conceptual Frameworks for Advanced Psychiatric Nursing Practice
Theoretical basis for psychotherapeutic nursing interventions is examined from a developmental perspective. The collaborative work of nurse and client is examined from initial contact through termination. Prerequisite: NUR 535A. [3]

NUR 535C Group Process, Strategies, and Interventions
In depth analysis of theory and research is presented as a basis for the clinical practice of group psychotherapy. Method of delivery is web-based. Prerequisite: BHV 528. [4]

NUR 535D Clinical Supervision in Psychiatric Nursing
Students engage with faculty and clinical preceptors in online clinical supervision through The Aha Center for Clinical Reasoning, a virtual study community centered around clinical stories. Students learn how to operationalize theoretical knowledge and research findings, through the therapeutic process with clients. Students also complete selected learning activities toward the development and reflective practice of all the core competencies necessary to become psychiatric mental health nurse practitioners (PMH-NP) in the 21st century. Co-requisite: NUR 541. [1]

NUR 541 Masters Practica
A minimum of 12 quarter hours of specialty practice are planned conjointly by the master's student and faculty member. Prerequisite or co-requisite: Core courses as determined by each program. Selected NUR 531-536, RN licensure. Clinical conference is included. Post master's student requirements are individually determined. P/N grade. [2-12]

NUR 542A Nurse Practice Validation-Anesthesia
This is a specialty seminar in nurse anesthesia designed to assess theoretical and clinical knowledge. A case discussion format is used that encompasses basic and advanced principles of nurse anesthesia with relevant physiological, pathophysiological, pharmacological information. Successful completion of this course provides credit for NUR 531A, B, and C in the nurse anesthesia curriculum as well as PHY 551, 552 and PPH 511, 512. May be repeated for a minimum of 9 hours for the Anesthesia Nurse Post-Certificate master's program. [3]

NUR 542B Nurse Practice Validation-PNP
This is a specialty seminar designed to assess theoretical and clinical knowledge of the pediatric nurse practitioner. A case discussion format is used that encompasses basic and advanced principles of care by the pediatric nurse practitioner. Successful completion of course and credit requirements results in credit for NUR 533F, G and H as well as PHY 551, PPH 512 and NUR 529. May be repeated for a minimum of 9 hours for the PNP Nurse Post-certificate master's program. [3]

NUR 543 Community Strategies in Adolescent Health
Research-based course will examine epidemiology of various adolescent health issues. Topics will include adolescent health behaviors and group-focused strategies and programs to deal with the issues. Pre- and co-requisite: NUR 575 and NUR 521. [3]

NUR 547 Independent Clinical Study
Intensive independent study in a specialty clinical area of nursing with faculty contract. RN Licensure and admission to the College of Nursing. [v]

NUR 548 MSN Capstone
The MSN project provides the graduating master's student with the opportunity to show knowledge of essential theory, incorporate research findings, demonstrate scholarly thought, and evidence application/focus to a population/problem. This project may be either an Evidence Based Practice Protocol or a Case Study/Management Project. Projects must be presented in both written and oral form. This project is the capstone evaluation for the MSN program. [1]

NUR 549 Independent Study
Contract with faculty member for conducting an independent academic study in a specialized area of nursing. [v]

NUR 550A, 550B, 550C, 550D Project Planning
Planning of the ND project using WebCT. Offered four quarters. [0-1]

NUR 555 The Leader and Policy, Politics, Power and Ethics
Course explores the use of political and policy development strategies to produce change. Topics include ethical issues related to leadership and change. [2]

NUR 556 The Leader as Catalyst for Change
Course covers topics related to the relationship between leadership qualities and organizational change. [2]

NUR 563 Financial and Business Planning
[3]

NUR 564 Human Resource Management
[2]

NUR 566 Data & Decision Making in a Rapidly Changing Environment
Skills necessary to effectively utilize data in the health care environment. [2]

NUR 567 Understanding Financial and Business Concepts
Basic concepts of healthcare finance needed to manage cost-effectively. Topics include statistics for decision making, strategic planning and developing a business plan. Admission to ND program or permission from instructor. [2]

NUR 568 Organizational Analysis and Evaluation
Course covers skills needed to design and conduct an organizational analysis and a program evaluation. [2]

NUR 569 Outcomes Management
Outcome measurement in the clinical setting. Topics include use of outcome measurement frameworks, selection of outcome measures and use of outcome data. [2]

NUR 573 Frameworks for Health Promotion
The course will review some of the more common frameworks used in health promotion research and practice. Students will critique models and discuss the applicability to nursing research and practice. This course may be taken by MSN or DNSc students. The focus for MSN students is on applicability to practice and for DNSc students; the focus is on synthesis and critique of the models for clinical research. Each group has its own section of the course. Prerequisite: NUR 521. [3]

NUR 575 Applied Epidemiology
Principles and methodologies of epidemiology are presented, including factors that influence the health status of individuals and populations. A framework is given for assessing measures of disease frequency and association, patterns of disease, and identification and analysis of health risk. Pre- or co-requisite: NUR 510. [4]

NUR 580A Issues in Pain Relief
Students explore the various theories of pain and how pain relief strategies evolve from these theories. The application of this knowledge to selected nursing practice situations is emphasized. [2]

NUR 581 Affecting Change Through Effective Communication
Use and critiques of various communication strategies in the change process. Topics: marketing, conflict management and use of communication media for various audiences. [2]

NUR 582 Planning for Change
Students, faculty and mentors finalize plans for initiation of change project. Requires 2-3 day one-site attendance. [2]

NUR 583 Implementing Change
Clinical seminar. Topics support student projects as they implement change project. [2]

NUR 584 Evaluating Change
Clinical seminar. Topics support student projects as they evaluate change project. [2]

NUR 586 Introductory to Multivariate Statistics
A course which introduces the student to the elementary concepts of multivariate statistics including multivariate regression, analysis of variance, cluster analysis, factor analysis and log Linear modeling. Prerequisite: NUR 510 or equivalent. [4]

NUR 588 Doctor of Nursing Project
Individual student or group contract with faculty members to plan, initiate, and evaluate a research-based change in nursing practice. [2]

NUR 589 Publishing in Nursing
Issues related to publishing in nursing. Emphasis is on publishing journal articles, book reviews and abstracts. [2]

NUR 590 Special Topics
Courses offered as electives in special areas of faculty interest or expertise upon demand. [v]

NUR 591 Doctor of Nursing Practica
A minimum of eight (8) credit hours of doctoral clinical are planned conjointly by the nurse doctorate student and faculty member. P/N grade. Prerequisite or co-requisite: Selected NUR 581-585. Admission to ND program. [2-8]

NUR 597 Role Transformation
Course meets with ND Capstone course. Topics include role transition and career development. [1]
NUR 598 Doctor of Nursing Capstone
Students present and critique capstone projects. Course requires 2-3 day on-site attendance. [2]

NUR 599 Independent Study
Student contracts with faculty member for independent academic study in a selected area of nursing. [v]

NUR 600 Residency
This course is designed to provide advanced practice nursing with an opportunity to develop clinical competency in the advanced practice role. The experience is accomplished under the guidance of an approved preceptor after completion of all program of study courses. Students register for 2 credits each quarter until the residency is completed. The number of clock hours of residency is determined by each curriculum. The course is taken under the pass/no pass provision. [2]

NUR 601A, B Theory Development
Theory construction explored throughout study of the philosophy of science. Prerequisite: NUR 501 or equivalent. [4]

NUR 661 Doctorate of Nursing Science Seminar I
This course invites students to consider the notion of scholarship. Examined are concepts of scholarships as well as ideas on how one comes to assume a scholarly identity. The student is asked to consider how doctoral education initiates the process of becoming a scholar and how one builds a surround that nurtures the life long pursuit of knowledge development. [1]

NUR 662 Doctorate of Nursing Science Seminar II
This online course provides the nursing professorate with an overview of what is expected of them in tomorrow's world and facilitates the development of the educator and faculty role. Participants will be introduced to a plethora of evidenced based teaching-learning frameworks, strategies, tools and technological innovations for moving to new methods and models of education. Participants at all levels of expertise can meet individual learning goals by selecting activities that are personally meaningful. [1]

NUR 663 Doctorate of Nursing Science Seminar III
Analysis of issues central to nursing leadership including developing leaders, setting directions for the profession, and creating a vision for leadership. Students consider vehicles for developing a leadership role in professional organizations, research, education, and clinical practice. Prerequisite: 3-6 hours of NUR 691. [2]

NUR 671 Research Design and Methods I
Development, integration, and application of knowledge, attitudes, and skills required to function as a clinical nurse scientist. Emphasized are the critical appraisal of selected measuring mechanisms and the design of clinical nursing research study. Prerequisite: NUR 601, NUR 586 or 8 quarter hours of graduate statistics. [3]

NUR 672 Research Design and Methods II
In Research Design and Methods II, the development, integration, and application of knowledge, attitudes, and skills requisite to functioning as a clinical nurse scientist are promoted. Emphasis is on the critical appraisal of selected research and instrument development studies and the beginning development of a clinical nursing research study. Prerequisite: NUR 601, NUR 586 or 8 quarter hours of graduate statistics. [3]

NUR 674 Nursing Outcome Research
Assist students to implement outcome research in on-laboratory or uncontrolled settings (clinical units, outpatient settings, and community settings). Prerequisite: NUR 672. [2]

NUR 675 Qualitative Research Methods
Focus is on selected issues in the design, conduct and reporting of qualitative research. Experience with data management and analysis included. Prerequisite: NUR 672 and NUR 601. [3]

NUR 676 Issues in Clinical Research
Goals of course are to: 1) provide a format for scholarly discussion of issues related to conducting clinical research; and 2) promote critical thinking skills needed to design and analyze studies of complex clinical phenomena. Prerequisite: NUR 672 and NUR 601. [3]

NUR 681 Theoretical Frameworks for Research
Concentration on articulation and analysis of the theoretical framework that supports their dissertation research. Emphasized is the clarity of the logic that connects concepts and ties the framework to the student's research interest. Prerequisite: NUR 601 and NUR 672. [2]

NUR 688 Directed Research
Independent research experience to test theory and/or gather data under the guidance of a faculty member is provided. Co-requisite: NUR 672. Admission to College of Nursing and permission of instructor. [v]

NUR 689A, B, C Research Grantsmanship A, B,C
Information skills essential to the process of development and submission of a research grant application is provided in a series of three progressive one credit modules. Prerequisite: NUR 672, or permission of instructor. [1 credit each module]

NUR 691 Doctorate of Nursing Science Practica
At least 20 credit hours of individually designed courses of independent study are planned conjointly by doctoral student and academic advisor. P/N grade. Prerequisite: All DNSc core courses. [v]

NUR 692 Clinical Defense
Student develops and presents defense of clinical scholarship experiences. [3]

NUR 699 Dissertation Research
Contract with faculty members and Associate Dean for Nursing Education for independent research. Doctoral candidate must be enrolled for at least three quarter hours each quarter or until dissertation has been defended. Prerequisite: Completion of clinical defense. [3]

Clinical Nutrition

NTR 503 Management in Dietetics
An examination of management strategies and techniques used in delivery of food and nutrition services in a health care setting. FA [2]

NTR 505, 506 Advanced Medical Nutrition Therapy I, II
Technical, conceptual, and behavioral aspects of dietary prevention and treatment of disease states are presented. Students apply principles of medical nutrition therapy to various disease states. SP FA [2] [3]

NTR 511, 512 Supervised Experience in Food Systems Management. I, II
Students function as members of the management team in the foodservice units of the medical center. Through increasingly complex learning experiences, students are expected to develop competence as an entry-level practitioner in food service management. Limited to clinical nutrition students. P/N grading. FA WI [3] [1]

NTR 513, 514, 515, 516 Supervised Experience in Medical Nutrition Therapy I, II, III, IV
Students will plan, organize, direct and evaluate nutrition care for individuals and groups of varying ages and lifestyles, across the continuum of care Students will function as members of the health care team with increasingly complex learning experiences and clinical responsibilities. Limited to clinical nutrition students. P/N grading. SP SU FA WI [2] [3] [4] [6]

NTR 521 Human Metabolism I
Digestion, absorption and transport of food components, energy regulation, and energy requirements are emphasized. WI [4]

NTR 522 Human Metabolism II
Protein metabolism and an overview of vitamins and inorganic nutrients are emphasized. Prerequisite: NTR 521. SP [4]

NTR 534 Nutrition in Critical Care
This is an advanced level supervised experience in enteral and parenteral nutrition. Current rationale and techniques for implementing and monitoring nutritional therapy in critically ill patients will be explored. Special attention is given to metabolic complications associated with enteral and parenteral feeding. Prerequisite: NTR 543, 516. WI SP [3]

NTR 535 Nutrition in Pediatric Critical Care
Supervised practicum based on scientific theory and practical application of nutrition support in critically ill infants/children. Studies include: nutritional requirements of premature infants; nutrition delivery in neonatal intensive care unit; enteral and parenteral nutrition therapies for pediatric patients with a variety of diseases and organ dysfunctions. Prerequisite: NTR 534. WI SP [1]

NTR 541, 542, 543, 544 Interrelationships of Nutrition and Disease I, II, III, IV
Pathophysiology of disease and the interrelated role of nutrition in genesis and treatment of disease are emphasized in this series. Prerequisite: NTR 522 WI SP SU WI [2] [4][2] [2]

NTR 549 Physiological Basis of Exercise and Nutrition
An examination of the physiological and metabolic adaptations to exercise and physical conditioning. Special attention is given to the nutritional needs of the human body in response to specific types of exercise. Prerequisite: NTR 522, 542 [v]

NTR 555 Nutrition Epidemiology
Because of growing understanding of how diets influence the risk of chronic disease and re-occurrence of disease, this course is designed to expose the student to a number of longitudinal population studies, both observational and clinical trials. WI [3]

NTR 565, 566 Seminar I, II
Students and faculty present research topics related to food, nutrition and/or foodservice management. WI WI [1] [1]

NTR 582 Introduction to Research
The course will focus on selection of a research problem and identification of designs and methodologies available to address the research problem. In addition, the course is designed to facilitate student interpretation and critical analysis of nutrition research literature. FA [3]

NTR 583 Food Systems Operations Analysis
A study of significant food systems management issues in the healthcare industry. [1]

NTR 586A, B, C Thesis I
Under faculty supervision, students will prepare and present a research proposal. Emphasis is on a review of current research literature and appropriate research design and methodology. Course may be taken across three quarters, one credit each quarter. Prerequisite: NTR 582. WI SP SU [1] [2] [1]

NTR 587 Thesis II
Students continue the research process. Data collection and initial data analysis will be performed as defined in the research proposal. Pre or co-requisite: NTR 586 FA [3]

NTR 588 Thesis III
Students will continue the research process through the completion and interpretation of statistical analyses and oral and written dissemination of the research results and conclusions. Prerequisite: Completion of NTR 586 SP [3]

NTR 590 Special Topics
In depth examination of contemporary professional issues. Content varies according to topic choices by instructor. Prerequisite: Instructor approval. [v]
NTR 592 Individualized Clinical Practice
For students who wish advanced experience in one or more areas of clinical nutrition practice. Limited to clinical nutrition students. [v]

NTR 595 Rationale for Dietary Reference Intakes
This course is designed to familiarize the student with scientific rationale for the Dietary Reference intakes. The application of these dietary standards for populations, subgroups, and individuals will be reviewed in both a historical context and one based on current literature. [2]

NTR 599 Independent Readings
Independent work on a selected topic. Students will complete a literature search and written paper on a topic related to nutrition or food systems management. Arrangements made with advisor prior to registration. Prerequisite: Instructor approval. [v]

Occupational Therapy

OCC 500 Occupational Therapy Orientation/Computer Application
This course is designed to familiarize the occupational therapy student with general OT practice, curriculum and professional organizations. An additional component of this class is computer applications in areas related to scholarly and clinical components of occupational therapy. [1-1-2]

OCC 502 Occupational Therapy History and Philosophy
Overview of the historical foundations of occupational therapy as they relate to the frames of reference and philosophical perspectives upon which the field is based. [3-0-3]

OCC 503 Occupation, Health and Development
The dimensions of occupation, as well as, its dynamic and reciprocal relationship between the health, wellness and illness continua will be explored. In addition, examination of the life span developmental process and its relationship to the performance of societal roles including one's chosen occupations will be facilitated. By integrating the concepts of occupation, health and development, their impact on the human's functional skills and occupational performance throughout the life-span will also be considered. [3-0-3]

OCC 504 Human Structure and Principles of Movement
The primary goal of this course is to understand and evaluate some of the musculoskeletal system related to the skill components of occupational behavior. Biomechanical principles are presented with application to treatment in examples of occupational performance dysfuntion. The student will learn and demonstrate the ability to give evaluation of posture, joint motion, muscle strength and body mechanics in selected activities. [3-1-4]

OCC 505 Group Dynamics
Didactic and experiential activities designed to familiarize the student with basic principles underlying group process and group behavior and clinical application of these principles in occupational therapy are studied. [2-1-3]

OCC 506 Medical Conditions Seminar
Selected medical, surgical, neurological and orthopedic conditions with emphasis on their etiology, treatment and prognosis will be explored through presentations & discussions. [3-0-3]

OCC 511 Occupational Therapy Interventions I
Students learn to apply theories and conceptual models for restoration of occupational performance based on psychosocial principles. The occupational therapy planning and implementation process is introduced and developed through concurrent interface with the pre-clinical experience. [4-1-5]

OCC 512 Occupational Therapy Interventions II
Students learn to apply theories and conceptual models for the restoration of occupational performance based on biomechanical and rehabilitative principles. Laboratory component includes splinting, wheelchair/positioning experiences and skill building in interventions and documentation. This course interfaces with the pre-clinical experience. [4-1-5]

OCC 513 Occupational Therapy Interventions III
Students learn to apply theories and conceptual models for the restoration of occupational performance based on motor learning, cognitive-perceptual and rehabilitation models of practice. Student will become familiar with basic splinting principles and demonstrate skill in constructing static splints. The occupational therapy planning and implementation process is introduced and developed through concurrent interface with the pre-clinical experience. [4-1-5]

OCC 514 Occupational Therapy Interventions IV
Students learn to apply theories and conceptual models for the prevention, development, remediation and restoration of occupational performance as it relates to various pediatric populations. [3-1-4]

OCC 516 OT Interventions I Fieldwork
Supervised part-time field experience related to the theory and application of occupational therapy in the area of psychosocial dysfunction. [1-0-1]

OCC 517 OT Interventions II Fieldwork
Supervised part-time field experience related to the theory and application of occupational therapy in the areas of biomechanical and rehabilitation principles. [1-0-1]

OCC 518 OT Interventions III Fieldwork
Supervised part-time field experience related to the theory and application of occupational therapy in the areas of neurodevelopmental and rehabilitation principles. [1-0-1]

OCC 523 Psychosocial Dysfunction
This course focuses on the functional abilities that are compromised by mental disorders and the side effects of pharmacotherapy. Interdisciplinary and occupational therapy interventions of mental disorders and chemical dependency are reviewed from the rehabilitation and occupational performance perspectives. [3-0-3]

OCC 525 Introduction to Neuroscience
Lecture-discussion formats cover the anatomy, functions, and the selected lesion of the central and peripheral nervous systems. The student will learn the basic principles of organization, structure and function within the human nervous system and correlate specific clinical signs and symptoms to lesions within the central and peripheral nervous systems. Examples of application to medical care and occupational therapy are included in selected assessment and treatment descriptions. [4-0-4]

OCC 531 Principles and Methods of Education
This course offers a range of practical methods for teaching and facilitating learning geared to the day-to-day realities encountered by occupational therapists. The students will explore a variety of learning and educational theories and their application so that they may be effective in their daily teaching experiences with clients, families and colleagues. [2-0-2]

OCC 536 Issues and Perspectives in Pediatric OT
Issues and perspectives, which are unique to the pediatric population are explored in this course. The course begins with foundational topics of occupational performance as it relates to various pediatric populations. To provide the students with clinical reasoning tools used in the occupational therapy process with children and their families, exploration of various frames of reference is then completed. [4-0-4]

OCC 537 Issues and Perspectives in Geriatric OT
Focuses on an understanding of the occupational therapist's role in working with the geriatric population including service delivery systems, normal and pathological changes occurring as one ages and specific interventions utilized by practitioners. [2-1-3]

OCC 542 Evaluation and Assessments
Administration, scoring, interpretation, and reporting of selected tests and informal assessments useful in an occupational therapy evaluation of clients of varying ages and disability will be examined in this course. Students will critically assess the merits of various instruments based upon the essential components of credibility, and will recognize the strengths and limitations of the instruments reviewed. Focus on the clinical reasoning used in the evaluation and re-evaluation process [i.e. selection of assessments, interpretation and application of results] will be explored and implemented. Ethical considerations required in evaluation process will also be addressed. [2-1-3]

OCC 543 Health Care Organizations
This course reviews and identified the factors, forces and dynamics of the environment in which health care services are provided. The interrelationships among various trends and forces likely to shape the roles and responsibilities of health care institutions in the future and their impact on occupational therapy will be discussed. [3-0-3]

OCC 544 Management Concepts for Occupational Therapy
Students will examine administrative activities related to the effective delivery of OT services, including program planning, organization, control and leadership. Personnel management, communication and effective use of professional and non-professional staff, fiscal accountability, quality management, marketing/promotions, and resource allocation will be presented. [2-0-2]

OCC 551 Occupational Therapy Perspectives in Ethics and Multiculturalism
This course will focus on understanding the many dimensions of multiculturalism so that the students may develop a basis from which to be sensitive to the uniqueness of individuals. Various perspectives with regards to the cultural beliefs about health, illness, and treatment and how these beliefs direct the formation of policy will also be explored. This course will conclude with the presentation of potential ethical and legal dilemmas in occupational therapy practice and experiential opportunities to use a range of problem solving techniques to handle these situations. [3-0-3]

OCC 561 Analysis of Occupational Performance
Focus will be on the development of task analysis skills by applying logical thinking, critical analysis, problem solving and creativity. Students will demonstrate an ability to grade and adapt occupation-based tasks and purposeful activity including the interaction of performance areas, components, and contexts through dynamic classroom exercises. [3-v-4]

OCC 573 OT Perspectives in Technology
Exposure to assistive technology with emphasis on assessment, selection, characteristics, and application. Emphasis will be on low technology and high technology devices and systems to include wheelchairs, seating systems, switches and computer units and the indications for use in the role of human performance. [1-v-2]

OCC 582 Research II
This course provides the students with an opportunity to explore and experience how both quantitative and qualitative research methodologies are used in clinical and management outcome research. Emphasis will be on design, data collection, analysis and interpretation, as well as, communication and presentation of findings. [4-0-4]

OCC 583 Research III
This course culminates the research sequence in the occupational therapy curriculum. It provides students with the opportunities to explore and experience clinical research and the outcomes that guide practice. The clinically-based beginning research investigator activities are conducted under the guidance of faculty in selected clinical programs. Emphasis will be on strategies related to collection, analysis, interpretation and reporting findings of data used to evaluate clinical practice. Small groups of students participate in weekly faculty-student seminars to explore the literature, activities and processes associated with the clinical outcomes studies culminating in a final report and presentation. [v-v-6]

OCC 590 Advanced Practice Seminar
This is a capstone course in which all aspects of practice are integrated and analyzed through a series of case studies and group projects. Students use clinical, scientific and ethical reasoning skills to work through a series of carefully designed problem-based learning projects. Cases are structured to reflect clinical complexities, nontraditional service delivery settings as well as emerging areas of practice. Professional development and competencies for varied professional roles and functions such as entry-level versus advanced practitioner, clinical specialist, supervisor/manager, educator, consultant, private practitioner, program developer, grantsmanship, researcher, entrepreneur, and advocate are explored. A series of lectures and invited speakers on certification, licensure and employment opportunities will be included. [4-0-4]

OCC 595, 596 Advanced Fieldwork I, II
Supervised field experiences applying theoretical O.T. concepts on subjects having psychosocial/physical dysfunctions. Full-time student status is continued while engaged in fieldwork. [12]

OCC 598A Preparation for Master's Thesis
This course will introduce the students to the master's thesis process. It will allow students to explore various topics in OT and to select a research problem relevant to current occupational therapy practice for their thesis project. [1] *

OCC 598B Master Thesis Proposal
Student will complete and defend preliminary thesis proposal. After revisions are made, student will complete and submit IRB proposal. [v] *

OCC 598C Research Implementation
Student will finalize preparation for research implementation, after which, implementation of thesis project based on research proposal will be completed and defended. Topic is to be relevant to current occupational therapy practice. [v] *

*Completion of thesis option will require enrollment in at least 9 credit hours between OCC 598A, OCC 598B, and OCC 598C.

OCC 599 Independent Study
Creative project designed by the student and supervised by faculty. [v]

Primary Care

PCM 500-506 Physical Diagnosis I-VI
Course will begin in the first quarter of the first year and continues for most quarters through the pre-clinical years. The focus of the first year component will be coordinated with the preceptorship experience and will emphasize professional behavior and the normal physical examination. The second year component will be concerned with advanced examination techniques and procedures (such as blood drawing).

PCM 511-514 Interviewing & Communications I-II
This course will begin in the first quarter of the first year and continue through the pre-clinical years. The focus within this course is on communication skills: the teaching formats will include use of standardized patients, role playing, video-taped histories and direct feedback from both patients and faculty.

PCM 521-526 Preceptorship Experience I-VI
This longitudinal experience is designed to provide students an opportunity to observe and interact with physicians and their patients in an outpatient/office setting. This includes visits to the offices of primary care physicians across all six quarters of the pre-clinical years. First year students are expected to have six such experiences.

PCM 531-533 Health of the Public I - III
The primary goal of Health of the Public is to provide students with an introduction to (1) the significant role played by the social and cultural milieu in which health care is practiced, (2) the influence of environmental and economic factors on the health and well-being of individuals, (3) how disease and illness are measured in a population, and (40 the application of this knowledge and skill to the health of both the individual and the community.

Pharmacology

PHR 501 Medical Pharmacology I
Introduction to the basic concepts which describe drug actions. The autonomic nervous system and related drug actions, neuropharmacology, psychopharmacology, and anesthetic/analgesic pharmacology. Prerequisites: BCH 472, NEU 451, PHY 452. FA [5-1-5]

PHR 502 Medical Pharmacology II
Anti-inflammatory, autocoid, cardiovascular, diuretic and respiratory agents, hypoglycemic agents, drugs acting on the blood and blood-forming organs, toxicology, antibiotics and cancer chemotherapeutic agents. Prerequisite: PHR 501. [4-0-4]

PHR 504 Introduction to Physiology and Pharmacology
This course integrates physiology and pharmacology to establish an understanding of drug actions as they relate to human organ system function. Topics include cellular function, immunity and infection, synapse, nerve, muscle, heart and circulation, kidney, respiration, gastrointestinal and urinary function, autonomic nervous system, central nervous syetem, hormones, and hemostasis and coagulation. WI [3]

PHR 521 Laboratory Instrumentation
Course covers principles and applications of experimental equipment. Instrumentation includes: ultraviolet and visible spectrophotometry, spectrophotofluorometry, thin-layer chromatography, column chromatography, high pressure liquid chromatography, atomic absorption, liquid scintillation spectrometry, isotope use and handling, pH adjustment, sample weighing, melting point determination, hematocrit determination, centrifugation, and glassware cleaning. SP [0-6-3]

PHR 541 Pharmacokinetics
Basic principles of the dynamics of absorption, distribution, and elimination under normal conditions and selected disease states. Prerequisite: PHR 503. WI [3-0-3]

PHR 542 Pharmacotherapeutics
The use of drugs in the diagnosis, prevention, and treatment of disease is presented with special emphasis in clinical pharmacology. SP [1-6 credits]

PHR 552 Introduction to the Regulatory Process
Seminars and directed readings on regulatory issues surrounding clinical research with human subjects is covered in depth. Topics include a) structure and function of the FDA and CDC, b) IRB legal issues, c) informed consent, d) patenting and copyright laws, e) IND legal issues, f) tort issues, g) patient rights, h) scientist rights, i) licensure issues for individuals performing research and laboratory assessments, and j) legal obligations of the pharmaceutical and biotechnology industry as it relates to university-based research. [2]

PHR 556 Tools for Research
This course focuses on the most effective ways to access information for specific research questions. Trainees will be exposed to a variety of programs by which literature searches and articles may be obtained at both the National Library of Medicine as well as the Internet. Additionally, they will learn the composition and structure of an NIH, Am. Heart Assoc. and pharmaceutical grant proposal. Moreover, they will learn the critical elements of each and how to use the Internet to enhance their proposal. Trainees will originate a hypothesis and use the methods described in this course to gather data and formulate a research plan to answer the question They will be expected to generate a ready to submit proposal of a small study. [2]

PHR 561 Drug Biotransformation
The various types of biotransformation reactions, including all Phase I and Phase II reactions are discussed in detail. The course describes in detail the biochemistry of drug inactivation both in the liver and at extrahepatic sites. Additional topics to be discussed include prodrugs and protoxins and special considerations needed when discussing the CNS, other separated compartments (e.g., certain tumors and bladder), and the influence of age, gender, hepatic induction, kidney failure, and genetic phenotypes. [2]

PHR 562 Toxicology/Drug-Drug Interaction/Poisoning
This course will cover in depth special issues relating to drug overdose, heavy metal poisoning, prescription drug side effects, natural and OTC poisoning, as well as their treatment procedures. The role of poison control center triage of cases, ER treatment, suicide management and unique considerations therein, and characteristic toxic profiles of drug classes will be described. Medico-legal issues associated with toxicology will also be discussed. [3]

PHR 568 Advanced Pharmacokinetics
This course will describe in detail the derivation and theory of pharmacokinetics. This course picks up where the general survey course given in the first year leaves off and describes the mathematical constructs behind PK measures as well as in depth discussion of two and multicompartment models. Upon completion of this course the trainee will be able to design and analyze results from a Phase I and II trials involving a drug acting in two compartments. [2]

PHR 571 Pharmacogenetics Readings
This readings course will survey the literature directed at understanding the relationships between biotransformation phenotypes and drug biodisposition. It will include discussion on G6PD deficiency and primaquine metabolism, acetylator phenotypes, phenytoin, microsomal enzyme systems and their genetic variation, alcohol dehydrogenase activity and distribution in various races, and the use of detoxification phenotypes to predict disease susceptibility (e.g., debrusiquine and PD). [1]

PHR 573 Readings in Drug Abuse and Addiction
The literature on drug abuse will be surveyed. Areas of emphasis will include the role of DA in addiction, the concept of the addictive personality and the genetics of addiction, the neurobiology of incentive salience, dissociation of tolerance from euphorogenic effects, history of addiction theory, and the unique aspects of various drugs of abuse. The ethics of chronic pain management in the clinical setting will also be discussed. [1]

PHR 581, 582, 583, 584 Research Skills and Progress I, II, III, IV
This seminar series will be held each quarter over three quarters and will focus on two alternate areas during the second year. One area requires that each trainee give at least one research in progress presentation so that formal presentation skills can be practiced and critiqued. A traditional meeting format with slides, a time limit of 12 minutes, and a question session will be the format for presentation. This component will also ensure that all trainees are aware of one another's research interest as well as serve to spawn ideas. On alternate weeks, presentations will be made by the faculty on a variety of topics to enhance research skills and capabilities Topics will include effective grant writing skills (while the trainees are actually writing their theses), Internet use for sharing, inputting and accessing data, technologies and data visualization, use of PowerPoint and other slide making database oriented programs, use of the Access database program, interviewing skills, philanthropy procedures, and effective scientific presentation skills. [1]

PHR 585 Clinical Pharmacology Research
This survey course describes in detail all aspects of performing clinical drug trials. It includes extensive discussion on IND applications, how drug studies differ from other types of studies, GLP certification procedures, informed consent procedures involving drugs, the characteristics of Phase I-IV studies and the special considerations involved with each, packaging and delivery considerations, role of the pharmacokineticist in the design and implementation of these studies, sample and data collection procedures, FDA oversight considerations, data analysis and interpretation, and laboratory responsibilities after the study is completed. [3]

PHR 591 Advanced Topics in Pharmacology
A series of faculty and student presentations and discussions addressing any advanced topic related to pharmacology. FA WI SP [2-0-2]

PHR 595 Clinical Pharmacology/Commercial Practicum
This practicum involves actual patient contact time in the clinical pharmacology units within Rush as well as the Chicago Center for Clinical Research. The practice is designed to expose the clinical scientist to the practical aspects of conducting clinical pharmacology research in both an academic and commercial setting. Seminars on recruitment procedures, study coordinators, specialty needs, and dealing with special populations will be provided. [2]

PHR 597 Clinical Pharmacology Thesis Research
A minimum of 8 research hours must be completed. This will involve actual time collecting data in a clinical pharmacology study either as part of an individuals own project or in collaboration with a mentor. As part of the requirements of this research, the investigator will have to either write an IND or a drug company research proposal as well as complete a written thesis and defend it publicly. [8]

PHR 590 Special Topics in Pharmacology
The course is designed to allow the student flexibility in independently pursuing a particular area of interest. May be taken for one or more terms. [v-v-v]

PHR 598 Research in Pharmacology
Laboratory research in an area of interest that will form the basis of a dissertation proposal or a thesis. By special arrangement. [v] Staff

PHR 599 Independent Study
[v]

PHR 622 Experimental Models in Pharmacology
Laboratory course focuses on techniques used in preparing experimental methods/models for research. SP [0-8-4]

PHR 691 Pharmacology Seminar
A pharmacology seminar series featuring speakers from outside and within the department. Students are required to make presentations a minimum of once a year. FA WI SP [1-0-1]

PHR 699 Dissertation Research
Laboratory research for the doctoral dissertation for Ph.D. candidates only. By special arrangement. [V]

Physiology

PHY 451 Physiology I
Comprehensive physiology course dealing with all major or an systems except the CNS. Concept formation and problem solving are stressed. Lectures are supplemented by small group discussions and laboratory exercises. Students are expected to discuss assigned study questions in group discussions. Laboratory exercises are divided between conventional experiments and computer simulations of physiological systems. FA [4-2-5] [64 hours]

PHY 452 Physiology II
Continuation of PHY 451. Prerequisite: PHY 451. WI [5-2-5] [58 hours]

PHY 502 Introductory Membrane Biophysics
Study of fundamental processes involved in movement of ions across membranes, excitability in nerve and muscle, equivalent circuit analysis, artificial membrane systems, structure of membranes, and active transport processes. [4-0-4]

PHY 503 Physiology of Striated Muscle
Topics: fundamentals of excitation-contraction coupling, mechanics of muscle, equivalent circuit analysis, muscle biochemistry, and developmental aspects of nerve and muscle. [4-0-4]

PHY 521 Mathematical Methods for Physiologists
Review of fundamentals of calculus in one dimension and generalization to several dimensions. Integration of basic functions, techniques of analytic and numerical integration, and Fourier series and transforms will be presented. Applications to Physiology are stressed and include quantitative analysis of ion-sensitive fluorescent dye experiments, mathematical descriptions of kinetic experiments, reaction rate theory, theory of diffusion, and image formation with microscopes. The equations of mechanics are taught toward explaining molecular dynamic modeling. [5]

PHY 524 Linear Differential Equations and Transform Methods
Study of first and higher order linear equation, linear algebra techniques, finite difference equations, Fourier series and transforms, Laplace transforms, and applications to solution of differential equations. [4-0-4]

PHY 528, 529 Programming-Numerical Method I, II
[3-0-3] [3-0-3]

PHY 551 Advanced Physiology I
A two course sequence with an emphasis upon normal body system regulation and integration. The importance of control through information between systems, as well as interdependency at all levels is stressed. May be taken out of sequence. Prerequisite: Undergraduate Anatomy and Physiology or equivalent. [4]

PHY 552 Advanced Physiology II
A two course sequence with an emphasis upon normal body system regulation and integration. The importance of control through information between systems, as well as interdependency at all levels is stressed. May be taken out of sequence. Prerequisite: Undergraduate Anatomy and Physiology or equivalent. [2]

PHY 590 Special Topics in Physiology
Advanced course dealing with selected topics in physiology. Particular subjects vary from year to year. [V]

PHY 598 Introduction to Research
A tutorial course designed to familiarize students with the literature and techniques applicable to modern physiological research. FA WI SP SU [v-v-v]

PHY 640 Applied Electrophysiology
An advanced laboratory course introducing students to the basic techniques of modern electrophysiology. Prerequisites: PHY 502, 503, 523. [3-6-6]

PHY 651 Advanced Topics in Muscle Physiology
Topics include equivalent circuit of skeletal muscle, problems in excitation-contraction coupling, and molecular events in the generation of mechanical force. Prerequisite: PHY 503. [3-0-3]

PHY 690 Research Topics in Physiology
With a member of the staff, the student participates in a laboratory-based experience in an area of current research. The level of participation depends on the student's background and will include examination of the literature, a review of the topics being investigated, and opportunities to participate in experimental work. In addition to work in the laboratories, independent experimental or bibliographic projects may be undertaken with the approval of a faculty member. A report is prepared describing the work attempted and accomplished. Prerequisite: PHY 452. SP SU [8 weeks]

PHY 699 Thesis Research
Post-candidacy research by arrangement. FA WI SP SU [v]

Pathophysiology

PPH 511 Advanced Pathophysiology I
A case study approach to identify principles of pathophysiology. Pathophysiological alterations occurring in selected disease processes are highlighted. The selection and use of appropriate clinical and laboratory data for assessment are emphasized. The application of course content to clinical case studies and vignettes is used for synthesis and enhancement of critical thinking. Prerequisite: Undergraduate Anatomy and Physiology or equivalent. [2]

PPH 512 Advanced Pathophysiology II
A case study approach to study pathophysiological alterations occurring in selected disease processes. The selection and use of appropriate clinical and laboratory data for assessment are emphasized. The application of course content to clinical case studies and vignettes is used for synthesis and enhancement of critical-thinking. Prerequisite: Undergraduate Anatomy and Physiology or equivalent. [4]

Pathology

PTH 500 General Pathology
The general concepts of pathology are studied, with an introduction to degeneration, inflammation, immune response, neoplasia and metabolic and toxic pathological processes. Microscopic anatomy of pathological changes are demonstrated to lecture and seminar groups. Prerequisites: ANA 451, 472. SP

PTH 511,512,513 Systemic Pathology I - III
Basic systemized study of human diseases affecting the various organ systems presented in lectures, seminars, and laboratory sessions. Concepts covered in PTH 500 will be stressed and correlated with the special pathology of organ systems and their functional and structural alterations. Fundamentals of laboratory testing presented with emphasis placed on interpretation of tests and the appropriateness of test ordering. Students learn to draw blood and will be expected to perform and interpret a few simple, but diagnostically important, laboratory tests such as urinalysis, hemacrit, and blood smear. No examinations are given in this course, but attendance is required. Prerequisite: PTH 500. FA WI SP

PTH 590 Post Sophomore Fellowship in Pathology
Major goals in this year long fellowship program in pathology is to provide a unique learning experience for the student which enhances his/her basic understanding of disease processes, their cause, manifestations, outcomes and therapy. This is accomplished by providing an environment which fosters small group learning in a clinical setting monitored by a devoted faculty. Daily interactions with resident pathologists will take place. The expectation is that the student of this self fulfilling year will become a leader as well as a scholar. He/she will attain a significantly greater knowledge of medicine than the average student, thereby motivating him/her to become a more understanding, compassionate and better doctor. Prerequisite: Satisfactory completion of pre-clinical curriculum.

Perfusion Technology

PRF 301 Introduction to Perfusion Technology
The history of the profession as well as the present and future role of the perfusionist will be studied. Aseptic techniques and a survey of cardiopulmonary components will be examined. This course includes both a clinical and lab component where the student will be introduced to ancillary procedures and extracorporeal circuit set-up.
FA [3]

PRF 302 Pathophysiology of Cardiopulmonary Bypass I
Cardiovascular physiology and pathophysiology will be studied. Pathophysiology will include acquired and congenital heart diseases. Prerequisite: PRF 301, PRF 331, PHY 551 WI [5]

PRF 303 Pathophysiology of Cardiopulmonary Bypass II
Physiology and pathophysiology relating to the patient undergoing extracorporeal circuit support will be explored. Topics will include gas transfer, acid-base, hemostasis and inflammation. Prerequisites: PRF 302, PRF 311, PRF 333, PHY 552 SP [6]

PRF 311 Junior Seminar I
Theory and practice of laboratory analysis, in-line monitors, extracorporeal safety devices and hemodynamic monitoring will be presented. This course includes a lab and clinical component where the student will continue to improve their clinical skills. The clinical component will be reinforced in a discussion format during class time. Prerequisite: PRF 301, PRF 331, PHY 551 WI [3]

PRF 312 Junior Seminar II
Special procedures in extracorporeal technology will be explored. The clinical and lab component will consist of patient management during extracorporeal circulatory support and special circuit demonstrations. Prerequisites: PRF 301, PRF 311, PRF 333, PHY 552 SP [5]

PRF 313 Junior Seminar III
Special procedures in extracorporeal technology will be explored. Prerequisites: PRF 303, PRF 312 SU [3]

PRF 331 Anatomy
Cardiovascular, respiratory, neural, renal, and hepatic anatomy will be presented. FA [3]

PRF 333 Pharmacology
The student will learn the fundamental principles and concepts of pharmacology. Presents the principles of drug absorption, distribution, and metabolism; the concept of drug receptor inaction; and the therapeutic uses and mechanisms of action of prototype drugs in each major drug group, particularly as it applies to the open heart surgical patient before, during and after surgery. Prerequisite: PHY 551 WI [3]

PRF 381 Introduction to Research and Project Design
Research studies are analyzed and evaluated relative to an identified clinical problem. Includes concepts, methods and strategies inherent to the research process with a focus on design, internal and external validity, sampling, measurement and ethical issues. SP [3]

PRF 431, 432, 433, 434 Clinical Experience I, II, III, and IV
This series of courses represents the student's clinical experience. Students will rotate through various locations, several of which will be outside of the Chicago area. By the end of the series the student will be able to demonstrate all skills of a competent perfusionist. SU, FA, WI, SP [10] [10] [10] [10]

PRF 441, 442, 443, 444 Project Design and Research I, II, III, and IV
In this series of courses the student will complete a research project suitable for submission to a peer-reviewed publication. SU, FA, WI, SP [2] [2] [2] [2]

PRF 451, 452, 453 Senior Seminar I, II, and III
In this series of courses advanced topics in extracorporeal technology will be discussed. Due to out-of-town clinical rotations, portions of this course material will be offered online. FA, WI, SP [1] [1] [1]

Psychiatry

PSY 501 Introduction to Psychopathology
A study of the range of psychopathology that will be manifested in clinical situations. By reviewing diagnostic criteria and by studying etiological factors underlying various forms of psychopathology that range from disturbances in cellular and neurotransmitter function through psychological and social stresses, students develop a basic understanding of common psychiatric conditions. Prerequisite: Behavioral Science 453. FA [3] [33 hours]

Pathology

PTH 500 General Pathology
The general concepts of pathology are studied, with an introduction to degeneration, inflammation, immune response, neoplasia and metabolic and toxic pathological processes. Microscopic anatomy of pathological changes are demonstrated to lecture and seminar groups. Prerequisites: ANA 451, 472. SP

PTH 511,512,513 Systemic Pathology I - III
Basic systemized study of human diseases affecting the various organ systems presented in lectures, seminars, and laboratory sessions. Concepts covered in PTH 500 will be stressed and correlated with the special pathology of organ systems and their functional and structural alterations. Fundamentals of laboratory testing presented with emphasis placed on interpretation of tests and the appropriateness of test ordering. Students learn to draw blood and will be expected to perform and interpret a few simple, but diagnostically important, laboratory tests such as urinalysis, hemacrit, and blood smear. No examinations are given in this course, but attendance is required. Prerequisite: PTH 500. FA WI SP

PTH 590 Post Sophomore Fellowship in Pathology
Major goals in this year long fellowship program in pathology is to provide a unique learning experience for the student which enhances his/her basic understanding of disease processes, their cause, manifestations, outcomes and therapy. This is accomplished by providing an environment which fosters small group learning in a clinical setting monitored by a devoted faculty. Daily interactions with resident pathologists will take place. The expectation is that the student of this self fulfilling year will become a leader as well as a scholar. He/she will attain a significantly greater knowledge of medicine than the average student, thereby motivating him/her to become a more understanding, compassionate and better doctor. Prerequisite: Satisfactory completion of pre-clinical curriculum.

Preventive Medicine

PVM 505 Epidemiology/Biostatics
The purpose of this review course is to provide students with a working knowledge of key concepts in epidemiology and biostatistics. These concepts, presented as "important terms" in each lecture hour, have been selected based upon their coverage on the USMLE Board exam. Thus, this course will serve as a preparation for this exam. The course is team taught in a lecture format by epidemiologists and biostatisticians from the Departments of Preventive Medicine, Medicine, and Psychiatry. An assigned textbook that covers the key concepts is highly recommended; lecture handouts are provided.

PVM 546 Principles of Biostatistics I
Covers statistical issues in clinical trial design. This includes blinding, randomization, bias, and intent to treat. Use of descriptive statistics and graphical techniques to explore patterns in data. A review of the basic properties of probability and the characteristics of the normal and binomial distributions. One and two sample inference and hypothesis testing for proportions, means and medians, one way analysis of variance and simple linear regression including diagnostics based on residuals and confidence intervals for regression coefficients are covered. Hypotheses testing for cross-classified data are also discussed. [3]

PVM 547 Principles of Biostatistics II
Covers multifactor analysis of variance, multiple regression, logistic regression including Hosmer-Lemeshow goodness-of-fit and receiver-operating curves. Survival analysis including log rank tests, Kaplan-Meier curves and Cox regression are covered. Additionally, statistical software packages such as SAS or SPSS are discussed. [3]

PVM 552 Principles of Clinical Research and Epidemiology
Introduction to the basic principles of epidemiology that form the basis for clinical research. This will include a discussion of: rates, risks, descriptive epidemiology, patterns of disease occurrence, screening, diagnostic testing, validity and reliability. The following areas will be emphasized: hierarchy of scientific evidence in medicine, distinguishing features of "good studies", methods of analysis of event-driven trials along with their pros and cons, dealing with concomitant confounders e.g., risk adjustment, compliance issues in clinical trials e.g. intent to treat vs. actual on therapy analysis. [3]

PVM 553 Observational Epidemiology
Course will provide an in-depth description of case-control and cohort studies. This includes: the different types (e.g. hospital- or population-based controls, retrospective and prospective cohorts, nested case-control), their strengths, weaknesses and uses, the definition and selection of cases and controls, matching and sampling, the definition and selection of exposure and comparison groups, the ascertainment of disease status and exposure status, and issues in analysis and interpretation of data, including the role of bias (selection bias, confounding bias, recall bias, misclassification of disease and exposure status), the effect of non-participation and loss to follow-up, and the application of various analytic approaches (stratification, standardization, and multivariate models). The computation, interpretation and application of basic epidemiologic concepts and statistics will be reinforced throughout the course, including measures of disease frequency (prevalence, incidence, attack rate) and measures of association (relative risk, odds ratio, risk difference, population attributable risk). Landmark studies illustrating the different types of case-control and cohort studies will be described. Trainees will be assigned readings from basic epidemiologic texts as well as publications from major case-control and cohort studies. [3]

PVM 554 Management, Evaluation and Statistical Interpretation of Clinical Trials
Coordinating center activities, sample size, adjustments for multiple looks, interim analyses, oversight, final analyses and summarizing analyses will be discussed and criteria for critiquing the literature (publications in peer-reviewed journals) will be discussed. Course will apply concepts and techniques from earlier courses to analyze data from clinical trials. Will focus on behavioral and cognitive data (including recruitment, retention and compliance issues). [3]

PVM 555 Introduction to Clinical Outcomes Research
Outcomes research focuses on evaluation the effect of interventions on a broad range of outcomes beyond traditional physiologic measures. This lecture series will examine health status, health related "quality of life," and patient satisfaction. [2]

PVM 557 Clinical Trial Design I
Presents an overview of all types of trial designs including large simple trials, randomized double blinded trials, crossover studies and others. The course applies concepts obtained in Basic and Observational Epidemiology courses to address how studies are set up to answer specific research questions. The course reviews experimental designs in the context of specific hypotheses, bias, and confounding. Publications from existing peer-review journals will be used to illustrate various trial designs. [2]

PVM 558 Clinical Trial Design II
This course focuses on practical application of the concepts learned in Clinical Trial Design I. Trainees will be expected to design various types of clinical trials e.g. multicenter, double blind, placebo controlled studies as well as large simple trials and describe rationale for blinding, methods of randomization and planned analysis. Issues of data interpretation will be covered. [2]

PVM 559 Research in Special Populations
The material in this course will concentrate on public health and research issues in African-Americans, women, Hispanics and children. Issues that are accentuated include: barriers for recruitment of patients into clinical trials, role of the "Coorandero" in aiding with protocol compliance and recruitment, influence of culture on disease processes, influence of environment and genetic predisposition for common disorders such as diabetes, hypertension, cancer and cardiovascular disease. [2]

PVM 561 Behavioral Approaches to Improve Compliance
The fellow will be exposed to the literature on the problems associated with compliance and retention in large-scale clinical and epidemiological research. A survey of behavioral barriers to compliance and retention will focus on emotional distress, health care beliefs, functional limitations, symptomatology, and cognitive deficits. Strategies to improve compliance and retention will be reviewed including doctor-patient communication, involvement of significant others, early identification of potential non-compliers or dropouts, and frequency of follow-up contacts. The fellow will be asked to conduct a case study with his/her own patients to determine optimum approaches to compliance and/or retention. This course will review data from the psychology literature that focuses on techniques to improve patient outcomes in clinical trials. [2]

PVM 562 Analysis of a Cardiovascular Population Database
The focus of this course will be on the application of methodological skills to help in the development of research hypotheses, and the analysis and interpretation of data. The fellow will have access to established databases which provide them with the opportunity to formulate research hypotheses. Then, under the supervision of an established investigator, they will learn how to translate hypotheses into statistical questions, manage data, organize a database for analysis, analyze data, and interpret results. Databases available include a) the Chicago Health and Aging Project, a longitudinal, population-based dataset of 6,162 adults, ages 65 and over, with a participation rate of 78.9%. The baseline dataset from this study is currently available. The first incidence cycle dataset will be available in 1999. The dataset includes interview and clinical examination data on the health and social problems of older adults, with a particular emphasis on risk factors for neurodegenerative diseases; b) database from the Chicago Study of Women's Health Across the Nation, a population-based study of women's' health at midlife with 2 parts: a cross-sectional telephone survey of 2,582 women between the ages of 40-55; and a longitudinal study of 1,000 pre-menopausal women, between the ages of 42-52, who will be followed as they undergo the menopausal transition. The cross-sectional survey dataset is currently available. The baseline dataset of the longitudinal study will be ready in early 1999. Variables in the dataset include endocrinological, cardiovascular, psychosocial, and risk factor influences on the course and outcome of the menopausal transition. Other datasets of post-MI patients, hypertensive patients, and post-menopausal women are available for study. Fellows will work closely with Dr. Powell and/or Dr. Denis Evans, MD, depending upon the research question of interest, in the formulation of questions and the interpretation of data. Assistance with programming and data management will be provided by the Department of Preventive Medicine. [3]

PVM 563 Psychosocial Influences on Clinical Trial Outcomes
The course reviews psychosocial factors affecting participation in clinical trials such as medication compliance, frequency of ide effects reported by the patients based on race and ethnicity and other related aspects. Focus will be on the case identification methods and clinical description, examination of laboratory and family studies, and follow-up studies. Risk factors and implications for treatment and prevention will be discussed. The course objectives are (1) review the major diagnostic entities in DSM-IV; (2) become conversant with the relevant literature in which the validity of these entities have been studied using descriptive, analytic, and experimental methods (particular attention will be focused on the Epidemiologic Catchment Area (ECA) Study and on the National Comorbidity Study for prevalence data, and on risk factor and outcomestudies. [2]

PVM 565 Readings in Cardiovascular Epidemiology
The objective of this course is to provide an overview of epidemiological research and clinical trials that cover the breath of cardiovascular disease. Readings will be selected from major population-based, observational studies (e.g., Atherosclerosis Risk In Communities - ARIC, the Cardiovascular Health Study - CHS), and from cardiovascular intervention outcome trials (SOLVD, ELITE). Discussions will focus on study design issues, such as sampling, assessment, randomization, and selection of primary and secondary outcomes. Additionally, attention will be given to important methodological concepts, such as confounding, selection bias and other sources of bias that may affect interpretation of the study findings. Special emphasis will also be given to determining statistical versus clinical significance, and how results from major epidemiological studies and clinical trials affect clinical practice. [3]

PVM 571 Meta-analyses of Clinical Trials
Methods and pitfalls of this methodology will be discussed. Fellows will perform a meta-analyses using various computer programs concerning unanswered questions in their respective area of research, where data exist but no large trial has been performed. Results will be presented to the class and critiqued. [2]

PVM 572 Advanced Logistic Regression Analysis and Interpretation of Survival Data
The course will extend the introduction to these topics provided in Principles of Biostat II. Model selection, goodness-of-fit, confidence intervals for parameter estimates and testing of model assumptions will be covered. The proper reporting of results from these analyses and useful graphical techniques for analysis and presentation will be discussed. [2]

PVM 573 The Economic Evaluation Of Medical Interventions
This course will train medical professionals in the basic methods of economic evaluation of medical interventions. Instruction will be primarily by case-study review of published studies, supplemented with theoretical presentations as needed. A wide range of intervention modes with different implications for study design will be considered, including surgery, secondary prevention, primary prevention, and screening. Topics common to all will include a) the different types of outcome measurement: mortality and life expectancy, functional limitations, quality of life, and health utilities; b) the different components of costs: direct medical costs of an intervention, medical cost savings from reduced morbidity, indirect costs such as lost work productivity, and future costs; and c) how these elements are combined into the most common types of economic evaluations: cost-effectiveness, cost-benefit, and cost-utility analyses. We will consider the design of clinical trials to include economic assessment as well as the use of published studies in secondary evaluations. [3]

PVM 575 Longitudinal Data Analysis
Analytic techniques discussed will include repeated measures ANOVA, Friedman's test, mixed effects models and generalized estimating equations. The strengths and weaknesses of the various approaches will be discussed. Graphical techniques for analysis and presentation and the reporting of longitudinal analyses will be discussed. [2]

PVM 576 Management of a Clinical Trial
The course will cover have the applicant aspects of the management of a clinical trial including resolution of problems by data safety monitoring board, protocol violations, impact of failing to achieve a particular target goal on outcome, etc. [3]

PVM 577 Readings in Trials of Renal Disease Progression
The objective of this course is to provide an overview of clinical trials that cover the breath of renal disease progression. Readings will be selected from major multicentered, randomized double blind trials (e.g., The Captopril, REIN, AIPRI and MDRD, UKPDS Trials), and from smaller well-controlled randomized multicentered crossover studies. Discussions will focus on study design issues, such as sampling, assessment, randomization, and selection of primary and secondary outcomes. Additionally, attention will be given to important methodological concepts, such as confounding, selection bias and other sources of bias that may affect interpretation of the study findings. Special emphasis will also be given to determining statistical versus clinical significance, and how results from major epidemiological studies and clinical trials affect clinical practice. [1-2]

PVM 578 Readings in Trials of Geriatric Populations
The objective of this course is to provide an overview of clinical trials that cover the breath of cardiovascular disease in elderly populations. Readings will be selected from major multicentered, randomized double blind trials (e.g., The SHEP, Syst-Eur, MRC and Australian Trials). Emphasis will be placed on systolic hypertension and its impact on disease development. Discussions will focus on study design issues, such as sampling, assessment, randomization, and selection of primary and secondary outcomes. Additionally, attention will be given to important methodological concepts, such as confounding, selection bias, and other sources of bias that may affect interpretation of the study findings. Special emphasis will also be given to determining statistical versus clinical significance, and how results from major epidemiological studies and clinical trials affect clinical practice. [1-2]

PVM 581 Quality of Life Assessment
An introduction to quality of life measurement will include discussion of the construct of QOL, use of QOL instruments in clinical trials, evaluation of QOL instruments, issues in QOL data collection and data integrity, cross-cultural issues in QOL assessment, and specific issues in pediatric QOL assessment. [2]

PVM 582 Design of Research Outcomes Studies
Examples of various types of outcome studies will be reviewed, including: cohort studies (retrospective and prospective), studies of analysis of variations in clinical practice and experimental outcomes research studies. [3]

PVM 583 Critical Appraisal of Outcomes Research
This course will examine in-depth selected readings from outcomes research literature, with a focus on effectiveness and cost-effectiveness design. [2]

PVM 584 Data Sources for Outcomes Research
Various types of data are used in outcome research. Strengths and weakness of various types of data will be explored, including: administrative data, data collected during routine clinical care and data from clinical intervention studies. [1]

PVM 588 Overview of Outcomes Research
The lecture will review early outcomes studies from Codman through the current "outcomes movement," focusing on measuring and assuring quality in the delivery of health care. As part of this lecture, the role of the Federal government in supporting outcomes research will be introduced [1]

PVM 593 Writing Practicum
The course builds on Tools for Research. The aim of this course is to teach the trainee how to organize and highlight the most important parts of a grant proposal. The course emphasizes writing style, consistency and integration of thought. All aspects of an NIH proposal are emphasized including the genesis of the budget and budget justification. [1]

PVM 597 Clinical Thesis Research
For trainees doing thesis research or writing. Prerequisite: Consent of the trainee's advisor; and acceptance of the thesis topic and preliminary thesis outline by the thesis committee. A minimum of 6 hours is required. P/N grade only. [v]

PVM 599 Independent Study
Advanced topics by arrangement with instructor. [v]

Vascular Ultrasound

VAS 301 Vascular Anatomy, Physiology, and Pathophysiology
This course is a detailed survey of the large, small, and microscopic vasculature of the human body including variations. Surrounding structures are also studied in their relationship to the vasculature. The purpose and normal mechanism of arterial and venous systems are studied. The disease mechanisms of a wide variety of disorders of arteries and veins will be presented, with emphasis on those diseases that can be assessed by noninvasive vascular studies. The risk factors, patient symptoms, and treatment of these pathophysiologic processes will also be presented. [3]

VAS 311 Physical Principles and Ultrasound Physics I
The basic principles of sound and ultrasound are introduced. Important math concepts are reviewed. The emphasis in this course is on the theories of ultrasound, including the basic parameters of sound, the Doppler effect, continuous wave Doppler, pulsed wave Doppler, and color flow. [3]

VAS 312 Physical Principles and Ultrasound Physics I Lab
Students will perform activities to demonstrate physical and ultrasound principles under a variety of conditions. Duplex equipment controls and equipment problem-solving will be emphasized in this course [1]

VAS 313 Physical Principles and Ultrasound Physics II
In Physics II, a continuation of the basic principles of B-mode, pulsed wave, and color Doppler are discussed emphasizing the components of the duplex scanner. The interaction of ultrasound and tissue, including ultrasound artifacts and bioeffects are also examined. Prerequisite: Physicial Principles and Ultrasound Physics I and Physics I Lab. [3]

VAS 321 Patient Care Practices
Vascular technologists not only use noninvasive equipment, but also interact with patients continually through the workday and have responsibilities for their care. This course prepares the technologist to offer patients safe examinations and transport, basic care of intravenous lines, oxygen, etc., and basic physical and emotional comfort during and around the time of testing. It offers the student information about general patient communication, and how to obtain patient history and symptoms of vascular disease while respecting the dignity and privacy of the patient. Patient attitudes in both health and disease are also reviewed in order to make the technologist more conscious of these attitudes and processes in a diverse world. Medical terminology is a large component of this course which is presented in order to foster communication between the vascular sonographer, physician, other health care workers, and the patient. [3]

VAS 322 Patient Care Practices Lab
Basic care of the vascular laboratory patient is presented in the didactic course and practiced in this laboratory course. Activities are provided to practice skills in providing basic physical comfort and care of the patient, transportation, and practice in communication skills. The student will also be introduced to other medical devices that they may encounter during patient testing such as catheters, drains, respirators, etc., and learn how to test and manage care around these devices within the scope of practice for a vascular sonographer. [1]

VAS 331 Venous Procedures (Lower and upper extremities)
Venous testing comprises the majority of vascular tests performed in the typical vascular laboratory (approximately 30 percent). The processes for performing deep vein thrombosis (DVT), chronic venous insufficiency (CVI), and vein mapping studies of the lower and upper extremities are presented primarily through the use of Duplex ultrasound. Indications, data analysis, reporting, and problem-solving procedures for testing patients with venous disease are also covered. These skills will be addressed in the didactic section and practiced in the laboratory portion of this course. [3]

VAS 332 Venous Procedures Lab
The venous procedures, data analysis, and problem-solving will be practiced on models in the student laboratory. Students will observe actual patient exams in the hospital. [1]

VAS 341 Arterial Procedures (Lower and upper extremities)
Approximately 25 percent of all noninvasive vascular studies investigate the peripheral arterial system. The process and technique of performing a physiologic arterial study of the lower and upper extremities is presented, including segmental pressures, continuous wave Doppler waveforms, and plethysmography. Indications, data analysis, reporting, and problem-solving procedures for testing patients with arterial disease are also covered. [3]

VAS 342 Arterial Procedures Lab
The physiologic arterial procedures, data analysis, and problem-solving will be practiced on models in the laboratory, including segmental pressures, continuous wave Doppler, and plethysmography. Students will observe actual patient exams in the hospital [1]

VAS 351 Cerebrovascular Procedures
Duplex ultrasound examinations of the carotid arteries have become an important means of identifying and grading the severity of atherosclerotic disease in the carotid arteries in stroke prone patients. These studies comprise approximately 30 percent of the studies performed in the vascular laboratory. The theories, process, and technique of performing a cerebrovascular study using duplex ultrasound is presented from beginning to end, including examination of the intracranial vasculature using transcranial Doppler (TCD). Indications, data analysis, reporting, problem-solving procedures for testing patients with cerebrovascular disease are also covered. [3]

VAS 352 Cerebrovascular Procedures Lab
The cerebrovascular procedures, data analysis, and problem-solving will be practiced on models in the laboratory using duplex and TCD equipment.. Students will observe actual patient exams in the hospital.[1]

VAS 361 Abdominal Vascular Procedures
Duplex ultrasound procedures used to assess the aorta, iliac, renal, mesenteric, and hepatoportal vessels will be addressed. Indications, data analysis, reporting, and problem-solving procedures for testing patients with abdominal vascular disease are also covered. [3]

VAS 362 Abdominal Vascular Procedures Lab
The abdominal vascular procedures, data analysis, and problem-solving will be practiced on models in the laboratory using duplex equipment and case studies. Students will observe actual patient exams in the hospital. [1]

VAS 371 Advanced Vascular Testing and Topics
More advanced examinations will be presented in this course including duplex scanning of the native arteries (upper and lower extremities), bypass grafts, arteriovenous fistula, pseudoaneurysms, dialysis access grafts, endovascular grafts, and intraoperative procedures. Indications, data analysis, reporting, problem-solving procedures for testing patients with complications/diseases are also covered. Test validation procedures are also covered in this course. Prerequisites: venous, arterial, cerebrovascular, and abdominal procedures and the respective laboratory courses, and Physics I and II. [3]

VAS 372 Advanced Vascular Testing Lab
The advance vascular procedures, data analysis, and problem-solving will be practiced on models in the laboratory using duplex equipment and case studies. Students will observe actual patient exams in the hospital. [1]

VAS 381 Research
The technologist who is to be a life-long learner and contribute to the knowledge base of his/her field needs to have an understanding of the methods of research available and how to use them. This course is an introduction to research processes and a basic analysis of research papers. Prerequisites: venous, arterial, cerebrovascular, and abdominal procedures and laboratory courses, Physics I and II. [3]

VAS 382 Research Lab
Students will perform basic research studies related to vascular technology in this course. [1]

VAS 401 Professional Practices
This course is designed to prepare the student for a career in vascular technology by presenting professional resources of information and continuing education, certification, laboratory accreditation, reimbursement processes and current issues, scope of practice, legal/ethical issues, and managed care. Stress and time management, and body mechanics are also covered for the technologist to care for himself in an intellectually, emotionally, and physically demanding profession. [3]

VAS 405 Laboratory Management
This course gives a broad overview of management tasks, such as laboratory organization, quality processes, teamwork, leadership, managing change, preparing a budget, purchasing equipment, decision-making processes, and human resource issues. [3]

VAS 411, 412, 413, 414 Clinical Practicum I-IV
During rotations through at least one clinical site, students will follow a structured plan of practice for each of the basic areas of testing. Each student will work under the supervision of a registered vascular technologist to first observe and then perform sections of the vascular test on patients in the laboratory. As skills are mastered, the student will ultimately perform complete examinations of patients with various levels of disease severity. The type of exam (whether it was observed, partially performed, or completely performed by the student), the exam results, and the difficulty of the case will be documented in a student log. Prerequisite: Students must have completed all junior level courses and passed with a minimum of a "C" and a GPA of at least 2.5. [11credits each]

VAS 431, 432, 433, 434 Senior Guest Lectures/Case Presentations I-IV
Students will meet as a class at regular intervals for guest lectures on a variety of advanced topics and participate in the weekly Vascular Lab Conference at Rush. Students will also prepare and present case studies from the patient exams they have performed at the clinical site. [1 credit each]

Rush Medical College Clinical Clerkships

Discipline Abbreviations. Courses listed and described in this section have been approved by the Rush Medical College Curriculum Committee and are administered by the Office of Clinical Curriculum. Offerings for the 2004-2005 academic year are listed in the online course catalog. This is available via the OASIS (Online Access to Student Information and Scheduling) website (http://rush.netkeva.com). Information about access to the website is available in the Office of Medical Student Programs, Armour Academic Center Suite 524. Clerkships are listed under the department or section responsible for the course. A three-character abbreviation for the discipline precedes the course number for each course listed. These elective course listings are constantly expanding to better address students' interests and career development needs.

ANA Anatomy
ANE Anesthesiology
DRM Dermatology
FAM Family Medicine
HHV Health and Human Values
MED Internal Medicine
MIC Microbiology
NEU Neurological Sciences
OBG Obstetrics and Gynecology
PED Pediatrics
PMR Physical Medicine and Rehabilitation
PSC Psychology
PSY Psychiatry
PTH Pathology
PVM Preventive Medicine
RAD Radiology
SUR Surgery

Course Numbers and Content. A three-digit course number follows the course abbreviation. It indicates the level of offering. Clerkships are all numbered 600-699 indicating doctoral-level work at Rush University. A course title is followed by a brief description of content and information pertaining to the clerkship.

Course Prerequisites or Corequistes. Specific prerequisites are noted for some clerkships. Where no prerequisite is listed, it is assumed that students enrolling have an adequate background on which to build. Students who have questions about preparation should consult with the course instructor. If a corequisite is listed, that course must be taken either during the same term or prior to the course which has a corequisite.

Designated Quarter. FA (Fall), WI (Winter), SP (Spring), or SU (Summer) are used to designate the quarter in which the course is offered each year.

Clinical weeks. Clinical rotations are considered full time. The number of weeks that students normally take each clinical course is indicated, e.g., [4 weeks]. These weeks also appear on the academic record. Clinical locations are sometimes identified. Students should contact the office of the Assistant Dean for Clinical Curriculum for availability of sites and times.

Grading. All clerkships are graded Honors (H), High Pass (HP), Pass (P) and Fail (F). Grades are recorded on the student academic record.

Anatomy

ANA 601 Surgical Anatomy
A laboratory program of special dissections and demonstrations. The applied, clinical, and surgical aspects of anatomical regions are emphasized. FA WI SP SU [2-4 weeks]

ANA 603 Advanced Histology/Cell Biology
The program will focus on in-depth study of histology/cell biology of regions designated by the participant and agreed upon by the Course Director. The program will incorporate didactic material with special emphasis on independent study and presentations on topics of interest at the forefront of the designated field. FA WI SP SU [2 weeks]

ANA 650 Basic Sciences Individualized Elective
Students may receive credit for individually arranged activities with Rush faculty members, outside faculty personal, private physicians or researchers, or persons in medically related field such as medical historians, ethicists, attorneys, and medical journalists. To receive credit, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision offered, and the specific dates of the rotation and note that the student will not receive any monetary compensation.. The student must submit the proposal to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Curriculum prior to beginning the rotation. A student may receive four weeks of credit for only one individually arranged elective. FA WI SP SU [4-8 weeks]

Anesthesiology

ANE 605 Anesthesiology
The program enables medical students to learn airway management; recognize circulatory inadequacy and initiate support of the failing circulation; induce topical and infiltrative anesthesia safely; understand the actions and interactions of depressant and stimulant drugs commonly encountered or used by anesthesiologists; and participate in pre-operative evaluation and preparation of surgical and obstetric patients. (Co-listed as SUR 605). Prerequisites: MED 601, SUR 601, OBG 601. FA WI SP SU [4 weeks]

ANE 605R Anesthesiology Research
Students will participate in new or ongoing research projects within the Anesthesiology Department via close one-on-one collaboration between the student and faculty member. Research projects are available in both basic (animal lab, biochemistry lab) and clinical sciences. Current areas of investigation include: neuropharmacology, pharmacokinetics, and treatment of acute and chronic pain in animals. Clinical studies involve the application of the significant findings from basic research in neuropharmacology to acute and chronic pain management in patients. The educational objective is to train clinical investigators in the field of anesthesiology. (Co-listed as SUR 605A). Prerequisite: SUR 601. FA WI SP SU [4-8 weeks]

Dermatology

DRM 616 Dermatology
Dermatological problems are studied under the direct supervision of the departmental staff; diseases are considered from the standpoint of etiology, pathogenesis, diagnosis, course, and treatment. Skin biopsy applications and techniques as well as histopathologic interpretation are emphasized. Skin therapeutics are taught, stressing biochemical and physiological considerations. Prerequisite: fourth year status. FA WI SP SU [4 weeks]

DRM 681 Research in Dermatology
Students may arrange research rotations individually with faculty at Rush. To receive credit for such a rotation, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision, and the specific dates of the rotation. The student must submit the proposal to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Education prior to beginning the rotation in order to finalize any arrangements. Research rotations are scheduled for a minimum of four weeks and a maximum of eight weeks in duration. No two-week research electives will be approved for credit. Research electives will apply toward the student's eight-week maximum allotted for credit in a given specialty. Fourth year medical students only. FA WI SP SU [2 weeks]

Family Medicine

FAM 601 Core Clerkship in Family Medicine
An intense ambulatory experience in family medicine. Students see patients initially and formulate their assessments and plans under supervision of senior residents and attendings. Participation in comprehensive, longitudinal care is stressed. The common problems and responsibilities of a primary care physician are observed and taught. A lecture series and syllabus supplement the clinical experience. Skills laboratories are provided for intruction in casting, suturing, and proctosigmoidoscopy, and gynecologic procedures. Diagnosis and treatment of alcoholism are also emphasized. Prerequisite: MED 503. FA WI SP SU [4 weeks]

FAM 601B Supplemental Family Medicine
Students participate in the Core Family Medicine Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

FAM 610 Family Medicine Subinternship
An intensive inpatient primary care experience at either Cook County Hospital, Illinois Masonic or MacNeal Hospitals. The subintern will function in a capacity similar to an intern, with supervision by a senior resident and faculty physician. Prerequisite: FAM 601, MED 601, PED 601, SUR 601. FA WI SP SU [4 weeks]

FAM 625 Alcoholism/Chemical Dependency Unit
Students will develop skills in interviewing and managing alcoholic and other chemically dependent patients. A longitudinal interdisciplinary experience is stressed, emphasizing detoxification, rehabilitation, and outpatient treatment. This rotation is offered at several sites. Prerequisite: FAM 601. FA WI SP SU [2-4 weeks]

FAM 641 Urban Primary Care
An advanced preceptorship with three family physicians in an urban practice. Students are expected to initiate and complete a research or quality improvement project focusing on preventive health services or the enhancement of access to medical care for minority communities. This rotation must be pre-arranged at least 4 weeks in advance with the course director. Prerequisites: FAM 601, MED 601, PED 601, OBG 601. FA WI SP SU [4 weeks]

FAM 643 HMO Network Primary Care Preceptorship
A preceptorship with a family physician practicing in a prepaid group medical practice (health maintenance organization). Emphasis will be upon preventive, comprehensive health care and upon understanding unique aspects of voluntary prepaid health care. This rotation must be pre-arranged at least 8 weeks in advance with the course director. Prerequisites: FAM 601, MED 601, PED 601. FA WI SP SU [4 weeks]

FAM 644 Holistic Health Care Preceptorship
The student will work with a health care team comprised of a family physician, nurse, and pastoral counselor. There will be participation in the health care of patients, encompassing medical, psychological, and spiritual issues. There is a particular emphasis upon wellness promotion and comprehensive health planning. Course director approval at least four weeks in advance. Prerequisite: FAM 601, MED 601, OBG 601, PED 601. FA WI SP SU [4 weeks]

FAM 645 Private Practice Preceptorship
A preceptorship with an experienced family physician, both at the office and in the hospital. The student will work in all areas of a busy physician's practice. Multiple sites in Chicago and suburbs are available. This rotation must be pre-arranged at least 8 weeks in advance with the course director. Prerequisites: FAM 601, MED 601, PED 601. FA WI SP SU [4 weeks]

FAM 651 Rural Primary Care - Streator
A preceptorship with an experienced family physician in Streator, Illinois, a town of 15,000 persons ninety miles southwest of Chicago. Students are responsible for their own living expenses. This rotation must be pre-arranged at least 8 weeks in advance with the course director. Prerequisites: FAM 601, MED 601, PED 601. FA WI SP SU [4 weeks]

FAM 652 Rural Primary Care - Sycamore
A preceptorship with a family physician group in a small community near DeKalb, Illinois. A full range of family medicine, including obstetrics, is practiced by this group.. Arrangement must be made at least eight weeks in advance with Dr. Waikus. Prerequisites: FAM 601, MED 601, OBG 601, PED 601. FA WI SP SU [4 weeks]

FAM 661 Principles and Practice of Wound Care
Designed to introduce the student to the multidisciplinary approach used in the management of chronic wound infections, including the evaluation and treatment of these wounds in the context of underlying complex medical conditions [including diabetes mellitus, renal failure, osteomyelitis, arterial insufficiency, spinal cord injuries, peripheral vascular insufficiency, and resistant infections]. Students will be introduced to new developments in wound care (platelet derived GF, skin grafting, vacuum assisted closure, compression pumps, etc.). Since the patients return to the clinic on a weekly basis for ongoing treatment, students will have the opportunity to participate in continuity of care, and observe the wound healing. Prerequisites: FAM 601. FA WI SP SU [2 weeks]

FAM 681 Research in Family Medicine
Students may arrange research rotations individually with faculty at Rush. To receive credit for such a rotation, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision, and the specific dates of the rotation. Students must submit proposals to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Curriculum prior to beginning the rotation. Research rotations are scheduled for a minimum of four weeks and a maximum of eight weeks in duration. No two-week research electives will be approved for credit. Research electives will apply toward the student's eight-week maximum allotted for credit in a given specialty. FA WI SP SU [4 weeks]

Health and Human Values

HHV 611 Medical Ethics
This clerkship offers an intensive hands-on experience, under the supervision of seasoned clinical ethicists, through which students can explore their own moral context, more reasoning, and ability to conduct moral analysis in the context of clinical medicine. Students will have the opportunity to direct some of the clerkship themselves toward ethical issues that they bring to the clerkship. In addition, the course director will seek to provide students some contact with physicians who practice in the area students chose for their residencies. Further, they will be able to make field trips to hospitals associated with the Rush Health Care System and to work with the ethicists at those sites: Copley Memorial Hospital, Rush North Shore, and others as they become available. Third-year medical students who have an interest in taking this course in their fourth year are encouraged to keep notes on encounters that have been ethically significant. Keep in mind not only situations about which you have ethical concerns but also those that exemplify the quality of care that you are preparing to provide. Prerequisites: Senior level students only. FA WI SP SU [4 weeks]

Internal Medicine

MED 600 Independent Study
Specialized topics studied independently under supervision of the medical student's advisor and associate dean for medical student programs. Normally pursued after the preclinical years. University enrollment fee is charged if full tuition is abated. Time spent in independent study does not count as clinical weeks toward the degree.

MED 601 Core Clerkship in Internal Medicine
This clerkship is designed to introduce students to the study and skills of clinical medicine. Through the case study approach, students have the opportunity to evaluate and manage a variety of patients and their problems. In this manner, students can develop their skills in history taking and physical examination and will review pathophysiological principles in caring for patients. Students will develop an understanding of relationships between disease states and patient hosts from the medical, social and emotional points of view. The ward team approach allows students the opportunity to actively work toward the goals of good patient care and the acquisition of a solid foundation of medicine. Students are expected to supplement their learning through a self-study program of learning objectives. This will provide the students with exposure to basic technical skills as well as a core set of topics in Internal Medicine. FA WI SP SU [12 weeks]

MED 601B Supplemental Internal Medicine
Students participate in the Core Internal Medicine Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

MED 605 Geriatric Medicine
The Bowman Health Center, Rush Homecare, Geriatric Care Partners and the Rush Alzheimer's Disease Center are a few of the sites of care where students will learn about models of care for older adults throughout the continuum of care. Students will help design a curriculum which will provide a broad exposure to inter-disciplinary care, medical ethics, end-of-life care, medical economics and medical care for older adults. Didactic endeavors will complement a variety of clinical experiences. This elective requires one month's notice and the course director's approval. Prerequisite: FAM 601 OR MED 601. FA WI SP SU [2-4 weeks]

MED 609 Combined Internal Medicine - Pediatrics
This elective is based at Lifetime Medical Associates, the continuity practice which is the focus of the Rush Combined Internal Medicine/Pediatrics Residency Program. This integrated resident-faculty outpatient practice focuses on family-oriented primary care. Students spend the day dealing with common outpatient problems in patients of all ages. Students will gain experience in office management, insurance issues, quality improvement, urgent care, and other areas important to general practice. Prerequisites: FAM 601, MED 601, PED 601, OBG 601. FA WI SP SU [4 weeks]

MED 610 Internal Medicine Subinternship
Students function at an advanced level, doing histories and physical examinations, diagnostic evaluations, and initiation of appropriate therapy. There is close supervision by the staff of the Department of Internal Medicine. The course is primarily intended for students desiring additional clinical experience in internal medicine. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 611 Cardiovascular Medicine
Includes study of the diagnostic spectrum of cardiac evaluation including bedside assessment, critical care cardiology, electrocardiography, electrophysiology, echocardiography, cardiac catheterization, coronary angiography, coronary care, interventional cardiology, preventive cardiology and exercise testing. Patient study is carried out under direction of the clinical staff. This rotation is not offered in July. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 612 Medical Intensive Care Unit
Experience in recognition/management of medical emergencies, particularly the use of temporary pacemakers, bedside hemodynamic monitoring, use of mechanical ventilators, and management of renal emergencies and cardiac arrhythmias. Patient care is carried out under the direction of the clinical staff. Prerequisite: MED 601. FA WI SP SU [4-8 weeks]

MED 613 Introduction to Cardiovascular Research
The student's program is individually planned with emphasis on understanding basic research techniques and completion of a project with the goal of submitting an abstract and/or manuscript. The student will be assigned to a specific faculty member based on his/her individual interest. The research program of the Section of Cardiology encompasses treatment and prevention of chronic heart failure, arrhythmias, and coronary artery disease; echocardiography; myocardial cell contraction; molecular biology of heart cell differentiation; and vascular biology. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 615 Emergency Medicine
Students will see patients in all areas of the emergency room under supervision of attending physicians. They will be expected to take a complaint-oriented history, with attention to pertinent past medical history, and perform a physical exam. They will record their findings on the Emergency Room Medical Record and discuss the patient with the attending. Together they will formulate a diagnostic plan, bearing in mind time and cost factors and priorities inherent in various diagnostic possibilities. Prerequisites: MED 601, OBG 601, PED 601, SUR OBG 601. FA WI SP SU [4 weeks]

MED 616 Poison Control
The Illinois Poison Center is a 24-hour emergency service fielding approximately 90,000 calls a year from parents, schools, work sites, emergency rooms, occupational medicine clinics, etc. regarding a variety of toxicological emergencies. Students will learn the basics in management of a poisoned or overdosed patient, including decontamination of toxins via all routes (i.e., ingestion, ocular dermal, inhalation). The student will gain a working knowledge of signs/symptoms, antidotal therapy, toxicologic laboratory, nomogram interpretation monitoring parameter and management appropriate to a variety of poisons including prescription and OTC medicines, household products, and plants. Students will attend morning rounds and case conferences at the Toxikon Group at John H. Stroger Jr. Hospital of Cook County at 9:00 a.m. This course must be pre-arranged at least four weeks in advance. Prerequisites: none. FA WI SP SU [2 weeks]

MED 619 Cardiology (Rush North Shore)
Students will learn basic clinical bedside inpatient and office cardiology and will be exposed to the more complex consultative aspects of clinical cardiology. Students are expected to become familiar with basic non-invasive and invasive cardiac procedures routinely performed including how to read 12 lead electrocardiograms and recognize common cardiac arrhythmias as may be observed on ambulatory electrocardiography, echocardiography, and coronary cineangiography testing. They will rotate with a non-invasive and an invasive cardiologist and allocate time as desired within the rotation. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 620 Cardiology (LaGrange Memorial)
Students will learn basic clinical bedside inpatient and office cardiology. This rotation includes hospital cardiology consultations, CCU and ICU experience, graphics including EKG interpretation, echocardiogram readings, treadmill studies, and Holter monitor readings, observation of invasive procedures including right and left heart catheterization, coronary angiography and ventriculography PTCA, and open heart surgery. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 621 Endocrinology and Metabolism
Endocrine and metabolic disorders are studied under the direction of the clinical faculty. Regular didactic sessions, departmental conferences and seminars supplement clinical work, which involves both outpatients at John H. Stroger Jr. Hospital of Cook County and Rush and inpatients at Rush. Prerequiste: MED 601. FA WI SP SU [4 weeks]

MED 622 Medical Intensive Care (Stroger)
Students will work with extremely sick medical patients, mechanical ventilators, and pulmonary artery catheters. Students will analyze critical care data, including arterial blood gases. Patient care is carried out under the direction of the clinical staff. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 623 Endocrinoloy & Diabetes (Stroger)
This rotation consists of supervised clinic experience of 4 to 6 patients per session, 7 to 8 clinic session per week, as well as multiple lectures and consultation rounds each week. The objective of the clerkship is to learn ambulatory endocrinology/diabetes. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 625 Emergency Medicine (Stroger)
Students who rotate through the Emergency Department will assume intern level responsibility for patient care. They will perform the primary evaluation for non-critical patients and assist in the management of critical patients. Every effort will be made to grant students autonomy commensurate with their experience and ability in patient management skills. Students will participate in weekly didactic conferences. Prerequisites: MED 601, SUR 601. FA WI SP SU [4 weeks]

MED 626 Nephrology
Clinical diagnosis and management of patients with renal disease as well as various fluid, acid-base, and electrolyte abnormalities are studied. Additionally, the course is directed toward the proper interpretation of pathophysiologic findings and the practical management of various disorders involving the excretory system and body fluids. Prerequiste: MED 601. FA WI SP SU [4 weeks]

MED 627 Nephrology and Hypertension (Stroger)
Student will see a variety of renal problems and become conversant with basic principles of nephrology and hypertension. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 628 Cardiology
The rotation consists of two weeks of CCU and two weeks of inpatient cardiology consults, or four weeks of CCU. Students will see patients on their own and present/discuss them with the team. They will attend cardiology rounds and conferences. Students will learn about presentation and treatment of common cardiac diseases including chest pain, acute coronary syndrome, and arrhythmia. Students will improve skills in the cardiac examination and in interpretation of EKGs. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 632 Digestive Diseases
The rotation is divided into two-week sessions; Gastroenterology and Hepatology. Students rotate on the Rush gastroenterology and hepatology inpatient services, including liver transplant. Students actively participate in consults, didactic lectures and bedside rounds. Students attend all conferences including Gastroenterology Grand Rounds, Medical- Surgical conference, Liver Transplant conference and Journal Club. An outpatient experience in both gastroenterology and hepatology is available once per week, if desired. There is an optional opportunity for those students wishing to participate in clinical research in the area of digestive diseases to incept projects during this rotation. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 634 Gastroenterology (Stroger)
Student will receive a thorough review of major gastrointestinal and hepatobiliary disorder topics via educational and interactive conferences. Students will see a variety of GI endoscopic findings and learn the approach and management of GI disorders as well as interpretation of laboratory tests and procedures. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 636 Hematology
An intensive exposure to clinical hematology. Students meet with residents, fellows and a teaching-attending hematologist daily for presentation and discussion of hospitalized hematology patients. Students work-up patients, present them to the attending and participate in patient care with medical residents. Blood and bone marrow slides on the service patients are reviewed daily with attending hematologists using a teaching (multi-headed) microscope. Bedside rounds follow the daily presentation of cases. A weekly multidisciplinary lymphoma conference presents diagnostic and therapeutic aspects of the malignant lymphomas. A weekly clinical conference is held in which a patient is presented and discussed in depth by students, residents and faculty. A recent addition is a daily self-learning session with a faculty member on a core topic of hematology. Twenty of these topics cover the spectrum of hematologic diseases. All conferences held by the Rush Cancer Institute are available to the students on an optional basis. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 637 Hematology (Stroger)
This program is designed to train students to learn to apply the skills of history taking and physical examination and to acquire the skill of morphologic interpretation of blood and bone marrow aspirates to the diagnosis and treatment of hematologic problems. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 646 Infectious Disease Consults
Students are exposed to a wide variety of acute and chronic infectious disease problems with emphasis on diagnostic and therapeutic approaches. Teaching is conducted in a case-study format in which students see new patients and present them to the attending on consultation rounds. Students spend two weeks at Rush and two weeks at John H. Stroger Jr. Hospital of Cook County on the respective Infectious Disease Consultative Services. Rush and John H. Stroger Jr. Hospital of Cook County have a joint Fellowship Training Program in Infectious Diseases. In addition, students attend a weekly two-hour infectious disease conference at Rush and a one-hour infectious disease conference at John H. Stroger Jr. Hospital of Cook County where they may present cases. Sixteen lectures on basic infectious disease topics are presented over the four weeks. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 647 Infectious Disease Externship
As externs on the Infectious Disease inpatient ward, students will act as daily care providers for newly admitted patients with HIV/AIDS, most of whom have opportunistic infectious and/or malignancies requiring in-hospital diagnostic evaluation and therapy. Students will participate in daily multi-disciplinary team courses that include an Infectious Disease attending, Intern Medicine house staff, clinical pharmacist, nurse practitioners, weekly multi-disciplinary rounds which include a psychologist, social worker, dietitian, and a dedicated nursing staff. Students will spend one-half day per week in the outpatient HIV clinic under the supervision of a Infectious Disease physician. Didactic sessions include a weekly one-hour Infectious Disease conference conducted at Cook County Hospital, a two-hour clinical Infectious Disease conference held at Rush, and sixteen lectures on basic Infectious Disease topics. Prerequiste: MED 601. FA WI SP SU [4 weeks]

MED 648 HIV Primary Outpatient Care
The CORE Center provides comprehensive outpatient Infectious Disease services. Founded by Rush and Cook County, the Center is operated by John H. Stroger Jr. Hospital of Cook County. Students will learn about HIV primary care including HIV counseling and testing; prevention, diagnosis, and treatment of opportunistic infections; and antiretroviral therapy. Experiences include adult, adolescent and pediatric HIV clinics, and brief exposure to a walk-in sexually transmitted disease clinic, and specialists in HIV dental, eye, cancer, hematology, and neurology specialty care, as well as mental health, social work, and chemical dependency support services. Didactic sessions include one-hour weekly Infectious Diseases conferences at the Core Center and 2 hour clinical conferences at Rush. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 651 Rheumatology
Students participate in all activities of the Section of Rheumatology, including patient care in clinics, inpatient consultations, conferences and didactic sessions. A wide variety of musculoskeletal conditions and connective tissue diseases are seen. Objectives include performance of musculoskeletal exam, synovial fluid analysis, arthrocentesis, therapeutic injection of joints and other structures, ability to formulate differential diagnosis of rheumatic conditions, and formulate long-term management programs. An interdisciplinary approach relies on contributions of immunology, orthopedics, diagnostic radiology, physiotherapy, and occupational therapy. The combined faculty and facilities of Rush University Medical Center and John H. Stroger Jr. Hospital of Cook County are utilized. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 661 Medical Oncology
Patients provide an ample and varied spectrum of oncological problems. Various therapeutic approaches and complications occurring in the course of the disease are discussed. The program stresses the importance of the combined interdisciplinary approach using resources of the Departments of Surgery and Therapeutic Radiology, as well as those of Pathology and Nuclear Medicine. Students may participate in the teaching programs of the Medical Oncology Ward on 11 Kellogg. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 662 Medical Oncology Consults (Stroger)
The clerkship consists of consultation rounds. The student will have the opportunity to manage directly a patient with a suspected or diagnosed malignancy. Outpatient experience is available, as well as specialty clinics with oncology. Prerequisite: MED 601. FA WI SP SU [4 weeks]

MED 671 Pulmonary Medicine
Students are exposed to the diagnosis and management of patients with a wide variety of pulmonary disorders. The essentials of pulmonary physiology, the use and interpretation of pulmonary function testing, and the provision of mechanical ventilatory support are emphasized. Prerequisites: MED 601, SUR 601. FA WI SP SU [4 weeks]

MED 677 Clinical Allergy/Immunology
Clinical approaches to the problems of allergy, other immune-mediated diseases and immunodeficiency in children and adults. Diagnosis and treatment of commonly encountered IgE-mediated diseases (allergic rhinitis, asthma, eczema and urticarla), as well as connective tissue diseases and Immunodeficiency syndromes are explained. Rotators are responsible for following inpatients admitted or referred to the Allergy/Immunology service and report to the attending physician-on-service on daily rounds. Allergy/Immunology Clinic outpatient care is demonstrated at John H. Stroger Jr. Hospital of Cook County Children's Hospital (3 times/week) and RUMC (4 afternoons/week). Rotators also learn about skin testing techniques, spirometry and immunological tests performed by the Rush Medical Laboratory. Teaching (basic science or clinical lecture, journal club, research and chart review) conferences are held at Rush. Prerequisites: MED 601. FA WI SP SU [4 weeks]

MED 681 Occupational and Environmental Medicine
The student will participate in four one-half day occupational medicine clinics per week; and will be assigned new and follow-up patients with occupational and environmental medicine [OEM] problems to evaluate and treat under supervision of one of the faculty. Student will attend Occupational Medicine and Toxicology conferences and be responsible for giving one "clinical rounds." In addition, at least one site visit to a factory or environmental hazard site will be arranged. Research projects are available for students wishing to make electives longer than one month. Prerequisites: MED 601. FA WI SP SU [2-4 weeks]

Microbiology

MIC 610 Clinical Microbiology
Rotatation in each of the basic areas of the microbiology laboratory. Specimen handling, laboratory identification of organisms, and clinical correlation are covered. Permission of instructor. Prerequisite: Basic clinical microbiology course, OSHA blood-borne pathogen training. [2 weeks]

Neurology

NEU 601 Core Clerkship in Neurology
Designed to introduce students to care of patients with neurological illness. Through an exposure to patients with a variety of illnesses, students will develop their neurological examination and history-taking skills, and develop an understanding of the work-up, diagnosis, and management of patients with neurological symptoms and diseases. It is strongly recommended students take MED 601 before this clerkship. At both Rush and Stroger Hospitals, the student has extensive interaction with both attending staff and residents, and participates in daily attending rounds. Didactic teaching during the rotation includes a formal lecture series on topics in clinical neurology, weekly departmental conferences including Neurology Grand Rounds, and weekly clinical-radiologic-pathologic conferences. Students participate in the diagnostic workups of assigned patients. At Rush, the student is a member of the general neurology floor service and the stroke/critical care service for two weeks each. At Stroger Hospital, students are a member of the neurology team that sees neurology in-patients and consultation patients, as well as attending two outpatient clinics per week. Students are expected to be in attendance at daily work rounds and daily attending rounds. They are responsible for performing a history and physical examination on their assigned patients and presenting their patients. Students are expected to be involved closely in the initial and daily follow-up care of their patients, including writing daily notes. In addition, students are expected to attend all lectures and conferences. There is in-house rotating call for medical students at both sites. Prerequisite: None (MED 601 strongly recommended). FA WI SP SU [2-4 weeks]

NEU 601B Supplemental Neurology
Students participate in the Core Neurology Clerkship and may receive two weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

NEU 602 Advanced Neurology
This advanced clerkship provides students the opportunity to further develop their clinical skills. Students will participate in the outpatient activities of the department and, in particular, will have ample opportunities to see patients in the movement disorder, epilepsy, muscular dystrophy, and multiple sclerosis clinics. This is a flexible program which will be structured to fit the interest and needs of individual students. Prerequisite: NEU 601. FA WI SP SU [2-4 weeks]

NEU 681 Neurological Research
Students may arrange research rotations individually with faculty at Rush. In order to receive credit for such a rotation, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision, and the specific dates of the rotation. The student must submit the proposal to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Curriculum prior to beginning the rotation in order to finalize any arrangements. Research rotations are scheduled for a minimum of four weeks and a maximum of eight weeks in duration. No two-week research electives will be approved for credit. Research electives will apply toward the student's eight-week maximum allotted for credit in a given specialty. Prerequisites: NEU 601. FA WI SP SU [Variable: 2 weeks minimum]

Obstetrics and Gynecology

OBG 601 Core Clerkship in Obstetrics and Gynecology
Study of female reproductive tract. Emphasis on routine obstetrics and gynecologic health care maintenance and patient education. Identification and management of high-risk pregnancy, infertility and other endocrinopathies, gynecologic oncology, family planning, psychosomatic disorders and normal psychological changes in obstetrics and gynecology as well as gynecologic surgery are some of the areas covered in detail. Prerequisite: none. FA WI SP SU [8 weeks]

OBG 601B Supplemental Obstetrics
Students participate in the Core Obstetrics/Gynecology Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

OBG 631 Maternal Fetal Medicine/High Risk Obstetrics
Emphasis of this elective is on the identification and management of high risk pregnancy. Ultrasonography, amniocentesis, medical and surgical complications of pregnancy, and operative obstetrics are some of the specific topics dealt with in detail. Students participate in ante-partum management of hospitalized and ambulatory pregnant patients with high risk conditions. Additional exposure to intra-partum problems is obtained through daily clinical teaching rounds and through follow-up of high-risk ante-partum patients as they go through labor and delivery. Special experiences and involvement in genetic counseling, prenatal diagnosis and obstetric ultrasound are also available. Prerequisite: OBG 601. FA WI SP SU [4 weeks]

OBG 661 Gynecologic Oncology
Students are exposed directly to medical, surgical, and research aspects of gynecological cancer care, beyond the scope of what is achieved during short-term required rotations. The student functions as a partner in a team of attendings, residents and nurses. Prerequisite: OBG 601. FA WI SP SU [2-4 weeks]

OBG 667 Reproductive Endocrinology and Infertility
Clinical experience in diagnostic evaluation and therapeutic management of couples with infertility and women with gynecologic endocrine problems. Students participate in routine diagnostic studies such as ovulation timing, postcoital tests, endocrine evaluation, etc., and are introduced to the use of diagnostic and therapeutic procedures such as hysterosalpingography, ultrasonography, laparoscopy, hydrotubation, etc. Students scrub on surgical reconstructive procedures involving female reproductive system and participate in the activities of the in-vitro fertilization program. Laboratory experience in performing hormone radioimmunoassay, sperm separation, anti-sperm antibody testing and other procedures may be included. Prerequisites: OBG 601. FA WI SP SU [4 weeks]

OBG 681 Research in Obstetrics and Gynecology
Research clerkship. Must meet with the Director of Clinical Curriculum and the Course Director to obtain prior approval for this rotation. Prerequisites: none. FA WI SP SU [4 weeks]

Pathology

PTH 601 Pathology Clerkship
Aimed at students considering post-graduate training in pathology, and students who desire to enhance and complement their knowledge of general pathology. The elective may be tailored to focus on student's specialty interests, if other than general pathology. Students will have hands on experience in techniques of grossing specimens in surgical pathology, molecular diagnostic techniques, image analyses, and clinical laboratory procedures. Students are encouraged to be involved in performance of autopsies, including weekends, if desired. This service usually requires 10-20 percent of the student's time in the elective. Students will have intimate contact with residents and attending staff. Prerequisites: MED 601. FA WI SP SU [4-6 weeks]

Pediatrics

PED 601 Core Clerkship in Pediatrics
Principles and practice of care of the patient from birth through adolescence are studied by direct patient contact. The course provides an opportunity for students to become proficient in the clinical basis of pediatric diagnosis. Clinical facilities of both inpatient and outpatient services of Rush University Medical Center, John H. Stroger Hospital of Cook County, and private physicians' offices are utilized. Regular seminars, conferences, lectures, and case presentations provide additional learning experiences. Student assignments include rotations in inpatient and ambulatory settings, and the nursery. Ambulatory activities constitute 50 percent of the clerkship. Night call is approximately every fourth night including weekends. FA WI SP SU [8 weeks]

PED 601B Supplemental Pediatrics
Students participate in the Core Pediatrics Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

PED 603 Special Care Nursery
This course is an introduction to the care of sick and premature newborn infants in the intensive care settings with emphasis on the normal sequence of events in the birth-recovery period, disruptions to that sequence and adaptation of the baby during the postpartum period. Care of the most common complications occurring at this age will be emphasized. Prerequisites: PED 601. FA WI SP SU [4 weeks]

PED 604 Adolescent and Young Adult Medicine
Direct experience in the care of hospitalized and outpatient adolescents and young adults. Hospitalized patients are seen at Rush University Medical Center. Outpatients are seen at a variety of sites including the Pediatric Ambulatory Care Center at Rush, the Methodist Youth Services offices on the North Side, the Teen/Family Planning Clinic in Evergreen Park, the Joliet and Chicago Job Corps Center and the Orr High School Clinic. Prerequisites: PED 601. FA WI SP SU [2-4 weeks]

PED 605 Adolescent Medicine (Stroger)
Under attending supervision, the Division of Adolescent Medicine provides a hands on clinical experience in Adolescent Medicine for fourth year students rotating in Pediatrics at John H. Stroger Jr. Hospital of Cook County. Students will rotate in a variety of clinical settings that include school-based health centers, the CORE Center, the Maryville DCFS Shelter, hospital-based clinics. As many of these clinics are off-site, transportation is a requirement. Prerequisite: PED 601. FA WI SP SU [4-8 weeks]

PED 609 Combined Medicine/Pediatrics
Based at Lifetime Medical Associates, the continuity practice which is the focus of the Rush Combined Internal Medicine/Pediatrics Residency Program. This integrated resident-faculty outpatient practice focuses on family-oriented primary care. Students spend the day dealing with common outpatient problems in patients of all ages. Students will gain experience in office management, insurance issues, quality improvement, urgent care, and other areas important to general practice. This elective is essentially an outpatient subinternship. Prerequisites: PED 601, MED 601, OBG 601, FAM 601. FA WI SP SU [4 weeks]

PED 610 Pediatric Sub-internship
The sub-intern will function in a capacity similar to an intern in one of two pediatric ward services. Supervision will be provided by senior residents and faculty physicians. Students are expected to take call every fourth night. Approval of course director required to drop the course within eight weeks of the start date. Prerequisite: PED 601, MED 601, FAM 601, SUR 601, fourth year standing only. FA WI SP SU [4 weeks]

PED 611 Pediatric Cardiology
Ambulatory experience can be obtained in caring for children with congenital and acquired heart disease, as well as assessment of innocent heart murmurs. Clinical history and physical findings are correlated with x-ray and electrocardiographic echocardiographic, and cardiac catheterization data. Didactic sessions are offered once a week which include learning the interpretation of ECG and chest x-ray. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 615 Chronic Diseases in Children
Based at Shriner's Hospital for Crippled Children, students participate in an active inpatient and outpatient program which provides referral services to children with musculoskelatal disorders, neural tube defects and other chronic diseases. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 616 Pediatric Ambulatory Care
This rotation offers students the opportunity to participate in primary care pediatrics in a variety of settings. A hands-on approach with individual attending supervision is emphasized. The student will follow private and clinic patients for both health maintenance and acute and chronic medical problems. Other settings available for student participation include Misericordia (chronic illnesses), the Rush General Care Nursery, and multiple homeless shelters. Students generate their goals and learning experiences for the rotation. The elective will be geared toward satisfying the student's individual needs and interests. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 621 Pediatric Endocrinology
This rotation provides students with a problem-oriented approach to pediatric endocrinology. All aspects of pediatric endocrinology are covered but particular emphasis is placed on normal and abnormal aspects of growth and pubertal development. The elective aims to highlight the role of the primary care provider in the initial evaluation of the pediatric patient with a suspected endocrine disorder and to provide the student with an introduction to specialized diagnostic endocrine testing and management of the endocrine patient. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 622 Emergency Pediatrics
Four 5-hour shifts per week are spent evaluating patients in the Emergency Room under the supervision of an attending physician. Evening and weekend shifts are included. The student is required to maintain a log of patients seen and procedures performed, to attend teaching conferences in the Emergency Department on Friday mornings from 7-10 a.m, and to present an informal lecture on a pediatric emergency medicine topic. Prerequisites: PED 601. FA WI SP SU [4 weeks]

PED 623 Emergency Pediatrics (Stroger)
Medical students will have an opportunity to see acutely ill children under direct supervision of senior pediatric residents and attending pediatricians. Students will be exclusively assigned to the Pediatric Emergency Department exclusively. The department has approximately 28,000 pediatric visits per year. Medical students will independently evaluate patients. After gathering data through history and physical examination, students will determine a problem list and likely differential. Students will present the patient to the attending physician who will review the findings. Students should be prepared to recommend needed laboratory or radiology tests but the determination to order them will be made only after consultation with the attending. Evaluation will be based on the attending physicians' observation of the student's ability to gather data accurately, their pediatric and general medical knowledge base, their ability to present patients in a cogent fashion, their ability to determine the need for and interpret laboratory tests, and their interpersonal skills with children, families, and staff. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 624 Pediatric Intensive Care Unit
Pediatric intensive care provides an experience in the care of the miost challenging hospitalized children. The student is an integral part of a team and will learn 1) the initial evaluation of the patient, 2) organization of care, 3) procedures (arterial catherization, central line placement) and 4) pediatric resuscitation techniques. Prerequisite: PED 601 and fourth year status. FA WI SP SU [4 weeks]

PED 626 Pediatric Nephrology
Experience in the care of children with renal problems in hospitalized and ambulatory patients. Emphasis is on participation on an active consulting service with concentration on normal and abnormal renal functions, electrolyte imbalances, proteinuria, hematuria, hypertension, urinary tract infection and developmental diseases of the kidney. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 631 Pediatric Radiology
Students observe radiologic procedures and participate in analyses, reviews, and general radiology conferences. Analysis involves assessment of examination's appropriateness, detection and interpretation pertinent findings, and synthesis of interpretation and clinical presentation into reasonable diagnosis. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 632 Pediatric GI/Nutrition
This clerkship will provide a core set of didactic materials and discussions. Emphasis will be on understanding the pathophysiology of, and basic approach to, common clinical problems. The nutrition component will include fundamentals of enteral and total parenteral nutritional management. Students will be expected to perform a literature review of one or more topics. Prerequisite: PED 601. FA WI SP SU [2-4 weeks, possible 2 weeks of GI or 2 weeks of Nutrition]

PED 641 Pediatric Allergy/Clinical Immunology
This elective teaches the clinical approach to the problems of allergy, other immune-mediated diseases and immunodeficiency in children and adults. Diagnosis and treatment of commonly encountered IgE-mediated diseases (allergic rhinitis, asthma, eczema and urticaria) as well as connective tissue diseases and immunodeficiency syndromes are explained. Students have primary responsibility for following inpatients admitted by or referred to the allergy/immunology service and reporting to the attending physician-on-service on daily rounds. However, primary emphasis is on Allergy/Immunology Clinic outpatient care at John H. Stroger Jr. Hospital of Cook County and Rush. Rotators also learn about skin testing techniques, spirometry and immunological tests performed by Rush Medical Laboratories. Teaching conferences are held Tuesday mornings and include basic science or clinical lecture, journal club, research and chart review. Prerequisite: PED 601. FA WI SP SU [4-8 weeks]

PED 642 Pediatric Hematology/Oncology
Course provides introduction to the care of children with a variety of hematologic disorders, or malignancies of childhood. A core lecture series is presented as well as a review of blood and marrow morphology. Students participate in the evaluation of new as well as established patients. Ward rounds are made daily for inpatients on the service and consultations. Outpatient clinics are held five days a week. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 643 Pediatric Hematology/Oncology (Stroger)
Students will take histories and perform physicals on patients with oncologic and hematologic problems and follow through with appropriate laboratory investigations. Both in-patient and outpatient facilities are available and students will have responsibility for patients under direct supervision of fellows and attending staff members. Course content covers exposure to pediatric hematologic problems and malignancies, which include anemias, coagulation disturbances, hemoglobinopathies, as well as Wilm's tumor, leukemia, neuroblastoma and rhabdomyosarcoma. Students will present seminars on hematological topics as well as follow coagulation procedures in the laboratory. Attendance at all regularly scheduled lectures and conferences such as Morning Reports, Grand Rounds, etc., in the Department of Pediatrics is encouraged. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 646 Pediatric Infectious Diseases
The focus is on clinical and laboratory evaluation of pediatric infections. An active consultation service provides ample opportunity for patient evaluation and follow-up. Correct use of laboratory facilities is stressed. Pathophysiology of infectious diseases, differential diagnosis, and antibiotic use are discussed on daily ward rounds and weekly conferences. Students see outpatients with diagnostic problems and attend specialized clinics for children with HIV infection, tuberculosis and congenital toxoplasmosis. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 651 Pediatric Neurology
Students will become acquainted with the broad scope of pediatric neurology with an emphasis on the basic examination of children with neurologic and developmental problems. Basic interpretation of common neurordiagnostic studies, as well as basic skills in the neurologic and developmental examinations will be emphasized. Students become familiar with common diagnoses such as epilepsy, migraine, muscular dystrophy, "developmental delay", and attention deficit disorder. Prerequisite: PED 601, 4th year standing. FA WI SP SU [4 weeks]

PED 661 Child Abuse and Neglect
Students will work one-on-one with attending physicians in the Division of Child Protective Services at John H. Stroger Jr. Hospital of Cook County, and will actively participate in work-up, management, and follow-up care of children suspected of being maltreated. Students will learn medical aspects of Physical Abuse, Sexual Abuse and Neglect (including Failure to Thrive). Students will have the opportunity to observe and participate in developmental evaluations of patients and in psychosocial evaluations of patients and their families. Students also attend and provide care in the weekly comprehensive follow-up clinic for abused and neglected children, and will also attend the Medical Clinic at the Children's Advocacy Center. Students will learn about the role of the physician as advocate for the child within the Child Welfare and Legal Systems and will learn about physicians' roles in coordinating multidisciplinary care for high risk patients and their families. Students will be expected present cases during rounds and a weekly multidisciplinary patient staffings. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 672 Pediatric Respiratory Medicine
The objectives for this clerkship are to expose the medical student to: 1) all facets of clinical practice involving pediatric patients with respiratory disease; 2) routine and infant pulmonary function testing; 3) a pediatric sleep laboratory; and 4) a dynamic setting where clinical research is underway. Experience will be provided in a consultative ambulatory care clinic for patients with asthma, cystic fibrosis and bronchopulmonary dysplasia, as well as patients with disorders of central respiratory control. The student will also participate in the consultative process for hospitalized patients in the intensive care units and on the general pediatric service. Prerequisite: PED 601. FA WI SP SU [4 weeks]

PED 681 Research in Pediatrics
Students may arrange research rotations individually with faculty at Rush. In order to receive credit for such a rotation, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision, and the specific dates of the rotation. The student must submit the proposal to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Curriculum prior to beginning the rotation in order to finalize any arrangements. Research rotations are scheduled for a minimum of four weeks and a maximum of eight weeks in duration. No two-week research electives will be approved for credit. Research electives will apply toward the student's eight-week maximum allotted for credit in a given specialty. FA WI SP SU [4-8 weeks]

Physical Medicine and Rehabilitation

PMR 601 Physical Medicine and Rehabilitation
An introduction to the field of Physical Medicine and Rehabilitation, including the care of patients with disabilities due to strokes, spinal cord injuries, head trauma, amputations, movement disorders, and arthroplasties, etc. In addition, students will be expected to observe, understand, and learn what services are provided by allied health professional staff, and when it is appropriate to prescribe these services. Prerequisites: none. FA WI SP SU [2-4 weeks]

Preventive Medicine

PVM 611 Interdisciplinary Training
Interdisciplinary primary care clinical and health promotion training for 3rd and 4th year medical and doctorate nurse practitioner students based in an elementary school in an underserved community. Provides students opportunities to develop and implement school and community-based interventions utilizing a team approach. The goals are to: 1) teach students how other disciplines practice in the community; 2) help students understand significance of social factors in maintaining health and well-being of their patients; and 3) improve the health of elementary school students and their families. Three days of clinical time are spent at Frazier Elementary School. Two days are spent on a special project research, preparation and implementation; and weekly independent or small group meetings with course director. Prerequisites: PED 601. FA WI SP SU [2-4 weeks]

PVM 621 Infectious Disease and Public Health
Students will become oriented to infectious diseases public health work by joining the State Epidemiologist's daily activities including outbreak investigation. When an outbreak is not occurring, students will be involved in an assigned brief research project oriented to review of medical literature and presentation of their findings for critical review by the State Epidemiologist. The remainder of time will be spent with field trips [i.e., county TB clinic, restaurant inspections with a sanitarian, wastewater treatment plant, or Quarantine Station at O'Hare Airport]. Lectures on various topics will be provided e.g., West Nile Virus in Illinois, Pertussis in Adults, and Outbreak Investigations of many diseases. Specific educational objectives are: 1) to gain basic understanding of public health infectious disease issues; 2) to expose medical students to career opportunities in public health; and 3) to develop an understanding of the local, state, and federal role in surveillance and control of infectious diseases. Prerequisites: none. FA WI SP SU [2-4 weeks]

Psychiatry

PSY 601 Core Clerkship in Psychiatry
Provides basic medical and didactic exposure to major psychiatric disorders focusing on diagnosis and management. Emphasis on aspects of psychiatry relevant to primary practitioner with a holistic approach to patient care, recognizing significant biological, psychological, and social/environmental factors contributing to the patient's illness. Systems concepts of care are presented in a integrated manner through graded, intensive clinical experiences. Inpatient settings employed for assignment of patient responsibility include general adult, intensive adult, consultation-liaison services, and clinical research. Outpatient settings include Stroger Hospital and clinical research at the Treatment Research Center at Rush. Prerequisites: none. FA WI SP SU [6 weeks]

PSY 601B Supplemental Psychiatry
Students participate in the Core Psychiatry Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum.

PSY 602 Psychosomatic Medicine
Designed for senior students interested in the internal medicine/psychiatry residency or psychiatry in a consultation/liaison setting. Adults hospitalized on medical, surgical, obstetric and neurological services are studied with supervised diagnostic evaluation and continuing management. Integration of the medical, psychological, family issues is emphasized including the role of the milieu-home, community, and hospital. Special work is done with dialysis patients, transplant patients, patients with malignancy, and those undergoing intensive care. Those interested in the combined internal medicine/psychiatry residency may choose to have additional experiences to acquaint them with the residency and this combined approach to patient care. Prerequisites: PSY 601. FA WI SP SU [4-6 weeks]

PSY 603 Child Psychiatry
Students will work with the treatment teams of the child psychiatric inpatient unit, the day school, the medication clinic and outpatient services for children and adolescents. Students attend seminars in child development, psychopathology and therapeutic modalities. They also participate in multidisciplinary staffings, case conferences, departmental grand rounds, journal club and clinical forum. Prerequisite: PSY 601. FA WI SP SU [4-6 weeks]

PSY 604 Adult Psychiatry
The objective is to increase student's knowledge of various psychiatric disorders and improve knowledge and skills in drug therapy, individual psychotherapy, family therapy and group therapy. Emphasis on crisis management and brief therapy in inpatient settings. Prerequisite: PSY 601. FA WI SP SU [4-8 weeks]

PSY 605 Geriatric Psychiatry
Rotation objectives: to increase the amount of experience in treating elderly patients with psychiatric diagnostic skills and the use of psychotherapy and pharmacotherapy with elderly patients; to learn the psychological changes that accompany the aging process; to become familiar with normal and abnormal states and processes in the elderly. These objectives are accomplished via: 1) readings in the field of geriatric psychiatry, and 2) direct treatment of selected patients with supervision by attending psychiatrists, fellows, and residents. Prerequisite: PSY 601. FA WI SP SU [4 weeks]

PSY 683 Clinical Research in Psychiatry
The student is exposed to basic clinical psychiatric research and will be involved with patients with a wide spectrum of psychiatric disorders. Most of the research is based on using medical treatment that is investigational. The objective of this clerkship is to become familiar with basic clinical research including use of psychiatric rating scales and basic research design. Prerequisite: PSY 601 FA WI SP SU [4 weeks]

Psychology

PSC 651 Clinical Sleep Disorders
Diagnosis and treatment of sleep and arousal disorders as recognized by the Association of Sleep Disorders Centers. Major diagnostic categories are reviewed in terms of clinical presentation, etiology, laboratory findings, and potential therapies. Students sit in with outpatients, interview in-patient consults, and review sleep studies. Prerequisite: Approval of course director. [2-4 weeks]

Radiology

RAD 601 Diagnostic Radiology
Basic radiologic principles are demonstrated and the role of diagnostic radiology as a clinical setting for patient care and medical and surgical specialty consultations is emphasized. Students prepare one case for the teaching file and gives one oral presentation. Students are assigned readings, teaching tapes to review, and are tested by a written final examination. A special lecture series designed specifically for the students, with lectures and unknown cases, presented by the diagnostic radiology attending staff and residents. Students are also urged to attend the two daily departmental teaching conferences. A minimum of four students any four week rotation. Approval of course director required to drop course within eight weeks of start of rotation. Not offered in June, July, November, December or January. FA WI SP SU [4 weeks]

RAD 606 Nuclear Medicine
All facets of the disciplines of nuclear medicine are studied, with particular emphasis on radionuclide scanning of organ systems for diagnostic and research purposes. Emphasis is on pathophysiologic correlation and case study. Literature review and individual topics are encouraged to provide in-depth study in the broad field of nuclear medicine. FA WI SP SU [2 weeks]

RAD 611 Interventional Radiology
This clinical clerkship exposes the student to interventional radiology with emphasis on patient care. Both non-vascular as well as vascular interventional examinations are performed on both inpatients and outpatients. Students will have assigned readings and will be able to attend lectures given by the diagnostic radiology attending staff and residents included in RAD 601. Available to Rush Medical College students only. Not offered in June, July or December. Prerequisite: RAD 601. FA WI SP SU [4 weeks]

RAD 612 Correlative Imaging
This clerkship exposes the student to ultrasound, computed tomography and magnetic resonance imaging with emphasis on correlation of radiologic findings. Students will be assigned reading and spend time in each of the various imaging sections in the radiology department working with attending physicians and residents. Available to Rush Medical College students only. Not offered in June, July or December. Prerequisite: RAD 601. FA WI SP SU [4 weeks]

RAD 621 Radiation Oncology
The student will participate in the normal activities of the department including consultations, treatment planning, and follow-up care of cancer patients. Students are assigned to two different services allowing exposure to different cancer sites. FA WI SP SU [2-4 weeks]

Surgery

SUR 601 Core Clerkship in Surgery
Consists of an eight week general surgery component in the M3 year, where assigned, and four weeks of surgical specialty selective(s) in the M4 year at Rush. The principles of preoperative and postoperative care, diagnosis of surgical disease, indications for surgery, recognition and response to surgical emergencies, and the physiological principles of surgery are stressed through the case study method. Students will be involved in the care of approximately three patients per week. Technical experience is provided in the operating rooms and dog lab. Lectures and conferences provide additional direct contact with faculty. FA WI SP SU [8 weeks]

SUR 601A Surgical Selectives
The final four weeks of the Core Clerkship in Surgery is the selection of two surgery specialties taken during the fourth year. The two specialties chosen are shown on the student's academic record under this title. Prerequisite: SUR 601. FA WI SP SU [4 weeks]

SUR 601B Supplemental Surgery
Students participate in the Core Surgery Clerkship and may receive two to four weeks of elective credit based upon a satisfactory clinical performance. Credit is granted on appeal to COSEP in conjunction with the course director who determines the amount of elective credit. Grade is determined by the clerkship course director upon consultation with the Assistant Dean for Clinical Curriculum. The specialties that exist include: anesthesia, cardiovascular surgery, transplant surgery, neurosurgery, ophthalmology, orthopedics, otolaryngology, plastic surgery, radiation therapy, thoracic surgery and urology.

SUR 604 Advanced Surgery
Under supervision, the student assumes many of the duties and responsibilities of a resident physician. This includes responsibility for pre-operative and post-operative care, participation in surgery, and rotating on-call service. The work is primarily with hospitalized patients, with opportunity for ambulatory and elective surgery. Independent library investigative projects are assigned. Prerequisites: SUR 601, MED 601, PED 601. FA WI SP SU [4 weeks]

SUR 605 Anesthesiology
The program enables medical students to learn airway management; recognize circulatory inadequacy and initiate support of the failing circulation; induce topical and infiltrative anesthesia safely; understand the actions and interactions of depressant and stimulant drugs commonly encountered or used by anesthesiologists; and participate in pre-operative evaluation preparations of surgical and obstetric patients. Prerequisite: MED 601, OBG 601, SUR 601. FA WI SP SU [4 weeks]

SUR 605A Anesthesiology Research
Students will participate in new or ongoing research projects within the Anesthesiology department. There will be close one-on-one collaboration between the student and the faculty member. Research projects are available in both basic (animal lab, biochemistry lab) and clinical sciences. Current areas of investigation include: neuropharmacology, pharmacokinetics, and treatment of acute and chronic pain in animals. Clinical studies involve the application of the significant findings from basic research in europharmacology to acute and chronic pain management in patients. [4-8 weeks]

SUR 606 Transplantation
The clinical aspects of transplantation, including donor and recipient surgery and preoperative and postoperative care are studied. The student participates in organ preservation as well. Seminars on the fundamental and clinical aspects of transplant immunology are held. Prerequisite: SUR 601. FA WI SP SU [4-8 weeks]

SUR 608 Trauma/Critical Care Surgery
This rotation is designed to provide the fourth year medical student with an in-depth clinical experience in the care of injured patients. Critical decision making and surgical training are the key elements taught during resuscitation, operative management and the critical care phase. The student will follow patients from the ambulance to their discharge home. Multi-level supervision and teaching is available from attending physicians and residents. Prerequisites: SUR 601, senior standing. FA WI SP SU [2-4 weeks]

SUR 610 General Surgery Subinternship
Students function at an advanced level, doing histories and physical examinations, diagnostic evaluations, common beginner invasive procedures and both initiation and management of surgical disease therapies. There is close supervision by the staff of the Department of General Surgery. The course is primarily intended for students desiring additional clinical experience in general surgery. Course director approval required to drop at less than eight weeks to start date. Prerequisite: FAM 601, MED 601, PED 601, SUR 601. FA WI SP (not offered in June, July, August and September)

SUR 611 Cardiovascular Surgery
This course emphasizes the clinical diagnosis and surgical management of adult and pediatric cardiac disorders. Pre-operative evaluation including review of cardiac catherization data, intra operative-management and post-operative care are discussed at conferences and in the operating room. Indications for surgery, preoperative evaluation and postoperative care are discussed at patient rounds, in conferences, and on an individualized basis. Prerequisite: SUR 601, 605. FA WI SP SU [4 weeks]

SUR 612 Surgical Intensive Care
This rotation exposes the experienced student to comprehensive management of critically ill surgical patients. Application of life support techniques including vasoactive drugs, mechanical aids to circulation, pacing, counter-shock, and respiratory therapy are taught. Pathophysiologic discussion and integration with cardiopulmonary analysis of data obtained from invasive monitoring are emphasized. Radiologic, medical, and surgical aspects of critical care medicine are also incorporated. Students will attempt to function as sub-interns with direct patient responsibilities. Prerequisite: MED 601, SUR 601, SUR 605. FA WI SP SU [4 weeks]

SUR 613 Peripheral Vascular Surgery
Course emphasizes the clinical non-invasive laboratory and radiologic diagnosis of peripheral vascular disorders considered for surgical management. Indications for surgery, pre-operative evaluation and post-operative care are discussed at patient rounds, in conferences and in operating room. Prerequisite: SUR 601, SUR 605. FA WI SP SU [4 weeks]

SUR 616 Plastic and Reconstructive Surgery
The primary goal of this clerkship is to provide an introduction to the surgical subspecialty of plastic and reconstructive surgery in as many of its various elements and diverse applications as possible. Plastic surgery covers a broad array of surgical/medical problems including wound healing; burns, both acute and long-term care; congenital anomalies such as cleft lip and palate and other craniofacial defects; breast surgery including breast reduction, augmentation, and reconstruction following mastectomy; microsurgical procedures for a free flap transfer, nerve repair, and other means of tissue transposition; hand surgery, ranging from acute industrial accidents to long-term rehabilitation for neuromuscular problems; care of facial fractures, both acute and delayed repair; care for trunk and extremity problems, relating both to trauma and tumor extirpation; and aesthetic surgery of the face, extremities and trunk. Prerequisites: SUR 601. FA WI SP SU [4-8 weeks]

SUR 626 Principles of Urology
This clerkship provides further experience in the diagnosis and management of urological problems as a supplement to the basic clerkship in surgery. Prerequisite: SUR 601. FA WI SP SU [4 weeks]

SUR 627 Genitourinary Neoplasia
Course presents basic concepts of neoplasia, using the genitourinary neoplasms as models. The student actively participates in the management of both hospitalized and ambulatory patients. Multidisciplinary seminars and individual projects are available. Course director approval required. Prerequisite: SUR 601, approval of course director. FA WI SP SU [2-4 weeks]

SUR 631 Pain Management
Student is exposed to the care and management of patients with low back pain, post herpetic neurolgia, complex regional pain syndrome and other common pain problem. This is a busy office setting where students will see new and returning patients to take histories, perform physical exams and assist in various nerve block procedures. Students will function as a junior house officer. Prerequisite: SUR 601, fourth year standing. FA WI SP SU [2-4 weeks]

SUR 641 Orthopedic Sports Medicine
A concentrated one-month elective in orthopedic sports medicine. Basic principles of physical examination, non-operative and operative treatment and rehabilitation of sports-related injuries are emphasized. Clinical exposure includes patient evaluation and hospital care, high school game coverage and sports event coverage with orthopedic house officers and staff attendings, experience in intercollegiate field house training rooms, and evaluation of acutely injured athletes. Diagnostic and surgical arthroscopy of the knee and shoulder, knee ligament reconstruction and shoulder reconstructive surgery are emphasized. A reading list is provided. A research paper is required. Prior approval of course director is required. Prerequisite: SUR 601, Senior standing. FA WI SP SU [4-6 weeks]

SUR 651 Orthopedics
Intended for students considering a career path requiring a knowledge of musculoskeletal problems. Students work with individual attendings on either the Joint Reconstructive Service, Foot-Ankle-Hand Service, Sports Medicine Service, Pediatric and Tumor Service, the Spine Service, or the Shriner's Hospital Pediatric Service. Students work with individual attendings in an office clinic setting, assist in surgery, and round on inpatients. Students are required to attend various clinical and resident education conferences. All students meet weekly with the course director for a student-only education conference. Educational goals include review of functional anatomy, understanding of injury triage, and concepts of treatment. Night call is not required, but is encouraged. Prerequisite: SUR 601, Senior standing. FA WI SP SU [4 weeks]

SUR 652 Orthopedic Research
This course requires special prior approval of the department prior to enrolling.Prerequisites: none. FA WI SP SU [8 weeks]

SUR 656 Neurosurgery
This clinical clerkship expands upon and demonstrates the practical application of neurological sciences. The diagnosis and management of both simple and complex neurosurgically-oriented disorders are addressed. Conferences with both the resident and attending staff are held weekly. Emphasis is placed on the basic neurosciences especially neuroanatomy and pathophysiology. Prerequisite: SUR 601. FA WI SP SU [2-4 weeks]

SUR 657 Principles of Ophthalmic Examination
The purpose of this course is to acquaint students with the surgical subspecialty of ophthalmology. They will learn basic ophthalmic terminology, history and examination principle, attend daily rounds and other didactic sessions, and observe surgery. It is intended that students will not only learn techniques of examination which will be useful in their own medical practices, but will also understand the capabilities and limits of the ophthalmologist in order to make better use of ophthalmic consultations. FA WI SP SU [2 weeks]

SUR 658 Research in Ophthalmology
Students with a special interest in ophthalmic research may take an elective of variable duration, but at least eight weeks. Students will be introduced to techniques of research including problem identification, study design, research methods, data collection, statistical analysis literature review, and manuscript production. It is not necessary for a project to be completed within the short period of the elective, nor is it guaranteed that a given research project will culminate in a publication. Research projects are available in both basic and clinical sciences. FA WI SP SU [8 weeks]

SUR 659 Otolaryngology
Clinical experience is provided in the diagnosis and management of patients with diseases of the ear, nose, throat, head, and neck. Office practice in addition to the care of hospitalized patients provide the basis for clinical instruction, with emphasis on case study and proper use of instruments. Departmental pathology, radiology, and otology conferences and journal club are included. Course director required. Prerequisite: SUR 601, approval of course director. Prerequisites: SUR 601. FA WI SP SU [4 weeks]

SUR 661 Surgical Oncology
Concentrated experience in the surgical diagnosis and management of patients with tumors is provided. Correlation of surgical problems with anatomic and pathological physiology is stressed, including examination of gross and microscopic tissue. Attendance at the tumor clinic, tumor conference, and head and neck tumor conference is required. Prerequisite: SUR 601. FA WI SP SU [4-6 weeks]

SUR 665 Colon and Rectal Surgery
Close one-on-one instruction between the student and physician in an apprentice-teacher relationship. The student accompanies the physician in all outpatient clinic office hours, as well as surgical procedures. This involves spending approximately 60 hours in a clinic environment, assisting in approximately 50 surgical and endoscopic procedures and daily in-hospital rounds. Prerequisite: SUR 601, approval of course director. FA WI SP SU [4 weeks]

SUR 671 Thoracic Surgery
The diagnosis, and operative and postoperative care of patients with pulmonary and esophageal disorders are studied in both hospitalized and ambulatory patients. In addition, students assist in patient care, and topics are assigned for discussion. Prerequisite: SUR 601. FA WI SP SU [4 weeks]

SUR 680 Interdisciplinary Studies
Designed to prepare students for teaching roles as residents and future faculty. Includes units on: educational experiences and socialization into medical education, understanding learners, the learning environment, and teaching strategies and skills. Students meet approximately three times/week for small group sessions and practice teaching sessions. Students complete guided observations of selected faculty and residents on rounds, in the classroom, clinic, OR and patient floor. Relevant literature is reviewed and students have opportunity to demonstrate and review their teaching skills on videotape. The course is co-directed by two surgical educators – one M.D., and one Ph.D. Faculty involved as master teachers in this course. Prerequisites: SUR 601, MED 601, Advance approval of course director required. FA WI SP SU [2-4 weeks]

SUR 681 Research in Surgery
Students may arrange research rotations individually with faculty at Rush. In order to receive credit for such a rotation, the person to whom the student will be responsible must write a letter describing the student's activities, responsibilities, amount of supervision, and the specific dates of the rotation. The student must submit the proposal to the Office of Clinical Curriculum for approval a minimum of eight weeks in advance of the rotation. The student must have written approval of the Director of Clinical Curriculum prior to beginning the rotation in order to finalize any arrangements. Research rotations are scheduled for a minimum of four weeks and a maximum of eight weeks in duration. No two-week research electives will be approved for credit. Research electives will apply toward the student's eight-week maximum allotted for credit in a given specialty. Prerequisites: SUR 601, MED 601, Advance approval of course director required. FA WI SP SU [4-8 weeks]

The 87 Endowed Chairs of Rush University

1963

THE JEAN SCHWEPPE ARMOUR CHAIR OF NEUROLOGY
This was the first endowed chair at any private hospital in the country. It was established as a memorial to Jean Schweppe Armour by Trustee A. Watson Armour III, other members of the Armour family, and by her friends as a tribute to her leadership as a Medical Center volunteer and a member of its Woman's Board.

Holders: Leyla deToledo-Morrell, Ph.D.
The Jean Schweppe Armour Professor of Neurology

Jeffrey H. Kordower, Ph.D.
The Jean Schweppe Armour Professor of Neurology

Maynard M. Cohen, M.D., Ph.D.
The Jean Schweppe Armour Professor of Neurology
Emeritus

1965

THE JOHN W. AND HELEN H. WATZEK CHAIR OF BIOCHEMISTRY
Established by John W. Watzek, Jr., an industrialist, to honor the memory of his parents. Mr. Watzek's philanthropy grew out of a relationship with the Medical Center and with his physician, Richard B. Capps, M.D.

Holders: Theodore E. Oegema, Jr., Ph.D.
The John W. and Helen H. Watzek Professor of Biochemistry Chairman, Department of Biochemistry

Klaus E. Kuettner, Ph.D.
The John W. and Helen H. Watzek Professor of Biochemistry
Emeritus

1967

THE WILLARD L. WOOD, M.D., CHAIR OF RHEUMATOLOGY
Established through a bequest of the late Charles S. Pillsbury, his family, and other grateful patients to honor their physician, Willard L. Wood, M.D., a 1930 graduate of Rush Medical College and a Rush Medical College faculty member for more than 45 years.

Holder: Joel A. Block, M.D.
The Willard L. Wood, M.D., Professor of Rheumatology Director, Section of Rheumatology

1968

THE HARRIET BLAIR BORLAND CHAIR OF PATHOLOGY
Established by Chauncey B. Borland, a Trustee of St. Luke's Hospital for many years, in memory of his mother, who shared his interest in clinical pathology and supported the same interests during her lifetime.

Holders: Robert De Cresce, M.D.
The Harriet Blair Borland Professor of Pathology Chairman, Department of Pathology

Meryl H. Haber, M.D.
The Harriet Blair Borland Professor of Pathology
Emeritus

THE RICHARD B. CAPPS, M.D., CHAIR OF HEPATOLOGY
Established by friends, patients and family in recognition of the contributions of Richard B. Capps, M.D., to medicine, particularly his pioneering research and study of hepatitis.

Holder: Donald M. Jensen M.D., F.A.C.P.

The Richard B. Capps, M.D., Professor of Hepatology
Director, Section of Hepatology
Division of Digestive Diseases

THE JOSEPHINE DYRENFORTH CHAIR OF GASTROENTEROLOGY
Established by a bequest of Mrs. Josephine Dyrenforth in appreciation of the care given her husband, Arthur, a well-known Chicago attorney.

Holders: Ali Keshavarzian, M.D.
The Josephine Dyrenforth Professor of Gastroenterology

Seymour M. Sabesin, M.D.
The Josephine Dyrenforth Professor of Gastroenterology
Emeritus

THE WOMAN'S BOARD CHAIR OF PEDIATRICS
Established by the Woman's Board of Presbyterian-St. Luke's Hospital, it was the first endowed chair of pediatrics at any hospital in the nation and the first major endowment by the Woman's Board.

Holders: Kenneth M. Boyer, M.D.
The Woman's Board Professor of Pediatrics
Chairman, Department of Pediatrics

Samuel P. Gotoff, M.D.
The Woman's Board Professor of Pediatrics
Emeritus

Joseph R. Christian, M.D.
The Woman's Board Professor of Pediatrics
Emeritus

1969

THE ELODIA KEHM CHAIR OF HEMATOLOGY
Established through the bequest of Elodia Kehm, widow of the owner of Kehm Construction, who died of cancer in 1932.

Holders: Stephanie A. Gregory, M.D.
The Elodia Kehm Professor of Hematology
Director, Section of Hematology
Co-Director, The Lymphoma Center, Rush Cancer Institute

William H. Knospe, M.D.
The Elodia Kehm Professor of Hematology
Emeritus

1970

THE MARY AND JOHN BENT CHAIR OF CARDIOVASCULAR-THORACIC SURGERY
Established through the leadership of Trustee John P. Bent. The chair, originally created as the Chair of Cardiovascular-Thoracic Surgery, was renamed on February 12, 1992, to honor the Bents, who provided the major philanthropy for this professorship.

Holders: Robert. S. D. Higgins, M.D.
The Mary and John Bent Professor of Cardiovascular-Thoracic Surgery
Chairman, Department of Cardiovascular-Thoracic Surgery
Co-Director, Rush Heart and Vascular Institute

Hassan Najafi, M.D.
The Mary and John Bent Professor of Cardiovascular-Thoracic Surgery
Emeritus

THE HARRY BOYSEN, M.D., CHAIR OF OBSTETRICS AND GYNECOLOGY
Established by gifts from the Woman's Board of Rush-Presbyterian-St. Luke's Medical Center, the Trustees, and grateful patients of Harry Boysen, M.D.

Holders: (the chair is currently unfilled)

Lourens J. Zaneveld, D.V.M., Ph.D.
The Harry Boysen, M.D., Professor of Obstetrics and Gynecology
Emeritus

THE JOHN M. SIMPSON CHAIR OF OBSTETRICS AND GYNECOLOGY
Established when John M. Simpson, a dedicated Trustee, first of Presbyterian Hospital, then of the merged Presbyterian-St. Luke's Hospital for 38 years, permitted his name to be identified with this endowment, which was made possible largely through his generosity.

Holders: Howard T. Strassner, M.D.
The John M. Simpson Professor of Obstetrics and Gynecology
Chairman, Department of Obstetrics and Gynecology

George D. Wilbanks, M.D.
The John M. Simpson Professor of Obstetrics and Gynecology
Emeritus

THE BISHOP ANDERSON CHAIR OF RELIGION AND MEDICINE
Established through the philanthropy of Mrs. Laurance Armour, Sr., and the leadership of Bishop Charles P. Anderson, Bishop of the Episcopal Diocese of Chicago from 1900 to 1930, as an important recognition of the heritage and commitment of Rush-Presbyterian-St. Luke's Medical Center.

Holders: (the chair is currently unfilled)

The Reverend Christian A. Hovde, Ph.D., D.D.
The Bishop Anderson Professor of Religion and Medicine
Emeritus

THE RALPH C. BROWN, M.D., CHAIR OF INTERNAL MEDICINE
Established by the family and friends of Ralph C. Brown, M.D., a 1904 graduate of Rush Medical College, who served as a professor of medicine and who was a member of the medical staff of Presbyterian Hospital until he died in 1954. Dr. Brown's son, R. Gordon Brown, M.D., a 1939 graduate of Rush Medical College, continued his father's tradition of dedication to patients and to Rush Medical College, as a former president of the Alumni Association of Rush Medical College, as a senior attending physician (emeritus) in Internal Medicine and as a Life Trustee of the Medical Center until his death in 1996.

Holder: Stuart Levin, M.D.
The Ralph C. Brown, M.D., Professor of Internal Medicine
Chairman, Department of Medicine

1971

THE THOMAS J. COOGAN, SR., M.D., CHAIR OF IMMUNOLOGY
Established in tribute to the late Thomas J. Coogan, Sr., M.D., and in memory of Benjamin F. Lindheimer by Mr. Lindheimer's daughter, Marjorie Lindheimer Everett, who recognized Dr. Coogan's outstanding service to the medical profession and encouraged great progress in the discipline of immunology at Rush.

Holder: Henry Gewurz, M.D.
The Thomas J. Coogan, Sr., M.D., Professor of Immunology
Chairman, Department of Immunology/Microbiology

THE JAMES LOWENSTINE CHAIR OF INTERNAL MEDICINE
Created by the Lowenstine Foundation to honor the president of Central Steel and Wire Company and to inspire and promote the Rush philosophy of patient-centered care and, in particular, the clinical training of the family doctor.

Holder: Gordon M. Trenholme, M.D.
The James Lowenstine Professor of Internal Medicine
Director, Section of Infectious Disease

1972

THE STANLEY G. HARRIS, SR., CHAIR OF PSYCHIATRY
Established as a lasting memorial to the late Stanley G. Harris, Sr., who, as a Trustee provided his leadership and generous philanthropy to Rush-Presbyterian-St. Luke's Medical Center for many years.

Holders: (The chair is currently unfilled)

Jan Fawcett, M.D.
The Stanley G. Harris, Sr., Professor of Psychiatry
Emeritus

THE J. BAILEY CARTER, M.D., CHAIR OF CARDIOLOGY
Established by a bequest of his widow, Ruth Carter, this chair honors J. Bailey Carter, M.D., a well-known professor of cardiology on the Rush Medical College faculty from 1928 to 1938.

Holder: Robert A. Balk, M.D.
The J. Bailey Carter, M.D., Professor of Cardiology
Director, Section of Pulmonary and Critical Care Medicine

1973

THE STANTON A. FRIEDBERG, M.D., CHAIR OF OTOLARYNGOLOGY AND BRONCHOESOPHAGOLOGY
Established by family, friends and grateful patients in honor of Stanton A. Friedberg, M.D., a pre-eminent physician, a 1934 graduate of Rush Medical College, emeritus professor, former department chairman and former president of the Presbyterian-St. Luke's Hospital medical staff.

Holder: David D. Caldarelli, M.D.
The Stanton A. Friedberg, M.D., Professor of Otolaryngology and Bronchoesophagology
Chairman, Department of Otolaryngology and Bronchoesophagology

1974

THE JACK FRASER SMITH CHAIR OF SURGERY
Established by Bertha Spaeti Smith, in memory of her husband, to recognize and honor outstanding physicians and surgeons in the department of surgery.

Holder: S. Forrest Dodson, M.D.
The Jack Fraser Smith Professor of Surgery
Director, Division of Abdominal Transplantation

1975

THE OTHO S. A. SPRAGUE CHAIR OF PATHOLOGY
Established to recognize the Otho S. A. Sprague Memorial Institute, which was created through the will of Otho S. A. Sprague, a civic leader in Chicago at the turn of the 20th century, and which, since 1938, has supported research at Rush, especially in the departments of biochemistry, immunology/microbiology and pathology.

Holders: Melvin M. Schwartz, M.D.
The Otho S. A. Sprague Professor of Pathology

Victor E. Gould, M.D.
The Otho S. A. Sprague Professor of Pathology
Emeritus

THE FRANCIS N. AND CATHERINE O. BARD CHAIR OF PHYSIOLOGY
Established in 1975 by bequest of Trustee Francis N. Bard, who took an active interest in the Medical Center that his family continues.

Holder: Robert S. Eisenberg, Ph.D.
The Francis N. and Catherine O. Bard Professor of Physiology
Chairman, Department of Molecular Physics and Physiology

1977

THE WILLIAM A. HARK, M.D.-SUSANNE G. SWIFT CHAIR OF ORTHOPEDIC SURGERY
Established by the bequest of Miss Susanne G. Swift, a patient of William A. Hark, M.D., and a generous gift of Mrs. William A. Hark, as well as personal gifts by members of the medical staff and the department of orthopedic surgery.

Holder: Gunnar B. J. Andersson, M.D., Ph.D.
The William A. Hark, M.D.-Susanne G. Swift Professor of Orthopedic Surgery
Chairman, Department of Orthopedic Surgery

1978

THE SAMUEL G. TAYLOR III, M.D., CHAIR OF ONCOLOGY
Established by friends, patients, and colleagues to honor Samuel G. Taylor III, M.D., a 1932 graduate of Rush Medical College and professor emeritus of internal medicine. Dr. Taylor remained involved in the section of medical oncology, which he founded, until his death in 1997.

Holder: Parameswaran Venugopal, M.D.
The Samuel G. Taylor III, M.D., Professor of Oncology

THE ROBERT C. BORWELL CHAIR OF NEUROLOGY
Established by Trustee Robert C. Borwell, to set an example for others to follow in providing for the endowment needs of the new Rush University and to support the research and treatment of multiple sclerosis and related diseases.

Holders: David A. Bennett, M.D.
The Robert C. Borwell Professor of Neurology
Director, The Rush Alzheimer's Disease Center

Floyd A. Davis, M.D.
The Robert C. Borwell Professor of Neurology
Emeritus

THE JOHN L. AND HELEN KELLOGG DEAN OF THE COLLEGE OF NURSING
Established by the John L. and Helen Kellogg Foundation as a memorial to Mr. and Mrs. Kellogg as part of a $4.5 million gift to the College of Nursing. This commitment also named the Kellogg Pavilion and created the John L. and Helen Kellogg National Center for Excellence in Nursing at the Medical Center.

Holders: Kathleen G. Andreoli, D.S.N.
The John L. and Helen Kellogg Dean of the College of Nursing
Vice President, Academic Nursing Affairs

Luther Christman, R.N., Ph.D.
The John L. and Helen Kellogg Dean of the College of Nursing
Emeritus

1980

THE HELEN SHEDD KEITH CHAIR OF GENERAL SURGERY
Established in tribute to Helen Shedd Keith, a member of St. Luke's Hospital Woman's Board and later of the combined boards of both Presbyterian and St. Luke's Hospitals, a founder of the Anchor Cross Society, and generous donor to Rush-Presbyterian-St. Luke's Medical Center. The chair was endowed by her daughter and son-in-law, Mary and John Bent.

Holders: Richard A. Prinz, M.D.
The Helen Shedd Keith Professor of General Surgery
Chairman, Department of General Surgery

Steven G. Economou, M.D.
The Helen Shedd Keith Professor of General Surgery
Emeritus

1981

THE CLARK WYLIE FINNERUD, M.D., CHAIR OF DERMATOLOGY
Established by Mrs. Clark W. Finnerud in tribute to the life and memory of her husband, a 1915 graduate of Rush Medical College, a professor and towering figure in the field of dermatology.

Holders: Michael D. Tharp, M.D.
The Clark Wylie Finnerud, M.D., Professor of Dermatology
Chairman, Department of Dermatology

Frederick D. Malkinson, M.D.
The Clark Wylie Finnerud, M.D., Professor of Dermatology
Emeritus

THE JAMES A. CAMPBELL, M.D., DISTINGUISHED SERVICE CHAIR
Established by a group of former chairmen of the Board of Trustees and special friends of the Medical Center to permanently recognize the vision, imagination, and personal dedication of the Medical Center's first president.

Holder: Larry J. Goodman, M.D.
The James A. Campbell, M.D., Distinguished Service Professor
Professor, Internal Medicine
President, Rush University

THE MUEHRCKE FAMILY CHAIR OF NEPHROLOGY
Established by Robert C. Muehrcke, M.D., and his family. The decision to establish this chair grew out of the training Dr. Muehrcke received at Rush and especially from the training he received from Robert C. Kark, M.D., who, as professor of internal medicine at Rush Medical College, is world-renowned for his pioneering work in renal biopsies.

Holder: Edmund J. Lewis, M.D.
The Muehrcke Family Professor of Nephrology
Director, Section of Nephrology

1984

THE WILLIAM GOTTSCHALK, M.D., CHAIR OF ANESTHESIOLOGY
Established and named in honor of William Gottschalk, M.D., a distinguished member of the departments of anesthesiology and obstetrics and gynecology. The chair was made possible through a bequest intention of Patricia Gottschalk and gifts from members of the department of anesthesiology.

Holder: Anthony D. Ivankovich, M.D.
The William Gottschalk, M.D., Professor of Anesthesiology
Chairman, Department of Anesthesiology

THE MAX S. SADOVE, M.D., CHAIR OF ANESTHESIOLOGY
Established primarily by gifts from members of the department of anesthesiology and patients and friends of Max S. Sadove, M.D., former chairman of the department.

Holder: Kenneth J. Tuman, M.D.
The Max S. Sadove, M.D., Professor of Anesthesiology
Vice Chairman, Department of Anesthesiology

1985

THE WOMAN'S BOARD CHAIR OF CHILD PSYCHIATRY
Established by the Woman's Board of Rush-Presbyterian-St. Luke's Medical Center as one of the first endowed chairs in child psychiatry in the nation, to serve the psychiatric needs of the children in the community. It is the second endowed Chair established by the Woman's Board.

Holders: Louis J. Kraus, M.D.
The Woman's Board Professor of Child Psychiatry

Elva O. Poznanski, M.D.
The Woman's Board Professor of Child Psychiatry
Emeritus

THE COLEMAN FOUNDATION, INC. CHAIR FOR THE DIRECTOR OF THE THOMAS HAZEN THORNE BONE MARROW TRANSPLANT CENTER
Established by the Coleman/Fannie May Candies Foundation to strengthen resources in the Midwest for cancer treatment and research, honoring the memory of Thomas Hazen Thorne, a former director of the Foundation who died of leukemia.

Holder: (the chair is currently unfilled)

1987

THE CIBA-GEIGY CHAIR OF BIOCHEMISTRY
Established by CIBA-GEIGY, the American arm of the multinational chemical and pharmaceutical firm headquartered in Switzerland, with hopes of conquering arthritis as one of mankind's most widespread afflictions, and as an example of the productive relationships between industry and academic medicine.

Holder: Klaus E. Kuettner, Ph.D.
The Ciba-Geigy Professor of Biochemistry
Chairman Emeritus
Department of Biochemistry

THE CLAUDE N. LAMBERT, M.D. - HELEN S. THOMSON CHAIR OF ORTHOPEDIC SURGERY
Established through the bequest of Helen S. Thomson, a patient, longtime friend and neighbor of the late Claude N. Lambert, M.D. Dr. Lambert served the Medical Center for 40 years and was a leader in setting the department of orthopedic surgery on the course which has brought it world recognized stature.

Holder: Bernard R. Bach, Jr., M.D.
The Claude N. Lambert, M.D.–Helen S. Thomson Professor of Orthopedic Surgery
Head, Division of Sports Medicine

THE CHARLES J. AND MARGARET ROBERTS CHAIR OF PREVENTIVE MEDICINE
Established through a trust created by the bequest of Mr. and Mrs. Charles J. Roberts, who were patients and longtime friends of the late physician, George W. Stuppy, M.D. In gratitude for Dr. Stuppy's care and friendship, Mr. and Mrs. Roberts directed a generous bequest to establish the Charles J. and Margaret Roberts Fund for Preventive Medicine.

Holders: Henry R. Black M.D.
The Charles J. and Margaret Roberts Professor of Preventive Medicine
Chairman, Department of Preventive Medicine

James A. Schoenberger, M.D.
The Charles J. and Margaret Roberts Professor of Preventive Medicine
Emeritus

THE GEORGE W. STUPPY, M.D., CHAIR OF ARTHRITIS
Established through the bequest of Mr. and Mrs. Charles J. Roberts to honor their special relationship with Dr. George Stuppy. It recognizes Dr. Stuppy's distinguished career of nearly 50 years as a physician, scientist and teacher at Rush-Presbyterian-St. Luke's Medical Center.

Holder: Eugene J.-M.A. Thonar, Ph.D.
The George W. Stuppy, M.D., Professor of Arthritis
Professor, Internal Medicine

THE JAMES B. HERRICK, M.D., CHAIR OF HEART RESEARCH
Established through the generosity of Mr. and Mrs. Charles J. Roberts, this chair recognizes the significant contributions of James B. Herrick, M.D., to cardiology and internal medicine. Dr. Herrick, a 1888 graduate of Rush Medical College, served on the college's faculty for many years.

Holder: James E. Calvin, Jr., M.D.
The James B. Herrick, M.D., Professor of Heart Research
Director, Section of Cardiology
Co-director, Rush Heart and Vascular Institute

1988

THE ALLA V. AND SOLOMON JESMER CHAIR OF GERONTOLOGY AND GERIATRIC MEDICINE
Established through the bequest of Solomon Jesmer, the chair is a tribute to Mr. Jesmer's late wife, Alla V. Jesmer, and to the care they both received in their last years at the Johnston R. Bowman Health Center for the Elderly. Mr. Jesmer hoped to advance research and education in the fields of gerontology and geriatric medicine.

Holder: Denis A. Evans, M.D.
The Alla V. and Solomon Jesmer Professor of Gerontology and

Geriatric Medicine
Co-Director, Rush Institute for Healthy Aging
Director, Center for Research on Health and Aging
Co-Director of Research, Rush Alzheimer's Disease Center

THE CATHARINE AND R. WINFIELD ELLIS-PHILIP N. JONES, M.D., CHAIR OF UNIVERSITY AFFAIRS
Established through the bequest of R. Winfield Ellis, this chair recognizes the importance of the patient-physician bond upon which the Medical Center has been built. In honoring their friend and physician, Philip N. Jones, M.D., the Ellises directed this gift to offer financial assistance for future health care providers educated at Rush University, with preference given to medical and nursing students.

Holder: John E. Trufant, Ed.D.
The Catharine and R. Winfield Ellis-Philip N. Jones, M.D.,
Professor of University Affairs
Dean, College of Health Sciences
Associate Provost, Rush University

1989

THE JOHN W. CURTIN, M.D., CHAIR OF PLASTIC AND RECONSTRUCTIVE SURGERY
Established by Mr. and Mrs. William A. Thomas, Sr., and other friends, patients, students and colleagues of John W. Curtin, M.D., former chairman of the department of plastic and reconstructive surgery, to pay tribute to him and his many accomplishments in the field of plastic and reconstructive surgery.

Holders: John W. Polley, M.D.
The John W. Curtin, M.D., Professor of Plastic and Reconstructive Surgery
Chairman, Department of Plastic and Reconstructive Surgery

Randall E. McNally, M.D.
The John W. Curtin, M.D., Professor of Plastic and Reconstructive Surgery
Emeritus

THE COLONEL ROBERT R. McCORMICK CHAIR OF DIAGNOSTIC IMAGING
Created through a gift from the Robert R. McCormick Charitable Trust, the McCormick chair builds upon the Trust's commitment to scientific investigation and diagnostic imaging as provided in the Colonel Robert R. McCormick Magnetic Resonance Facility, which was established in 1983.

Holder: David A. Turner, M.D.
The Colonel Robert R. McCormick Professor of Diagnostic Imaging
Director, Robert R. McCormick Magnetic Resonance Facility

THE DR. GLENN G. AND BLANCHE S. EHRLER CHAIR OF OBSTETRICS
Established through a bequest of Dr. and Mrs. Glenn G. Ehrler. Dr. Ehrler was a 1931 graduate of Rush Medical College, took his internship at Presbyterian Hospital and subsequently enjoyed a successful career in surgery.

Holder: Ewa Radwanska, M.D., Ph.D.
The Glenn G. and Blanche S. Ehrler Professor of Obstetrics

THE INDEPENDENCE FOUNDATION CHAIR IN NURSING EDUCATION
Established through the generosity of the Independence Foundation of Pennsylvania to advance nursing education and promote the pivotal role of nursing in the 21st century.

Holder: Ann Minnick, Ph.D., R.N.
The Independence Foundation Professor of Nursing Education
Director, Office of Nursing Services Research and Support

THE CYNTHIA OUDEJANS HARRIS, M.D., CHAIR OF PSYCHIATRY
Established through the dissolution of the Stanley G. Harris, Sr. Trust, of which the Medical Center was a beneficiary, this professorship honors the daughter of former Trustee Stanley G. Harris, Sr. and the sister of Life Trustee, Stanley G. Harris, Jr., who dedicated her life to the practice of psychiatric medicine.

Holder: Arnold I. Goldberg, M.D.
The Cynthia Oudejans Harris, M.D., Professor of Psychiatry

THE STANLEY G. HARRIS FAMILY CHAIR OF PSYCHIATRY
Also established through the dissolution of the Stanley G. Harris, Sr. Trust, this chair pays tribute to the Harris family's faithful stewardship of the Medical Center through the years.

Holder: David C. Clark, Ph.D.
The Stanley G. Harris Family Professor of Psychiatry
Research Director, Rush Institute for Mental Well-Being
Executive Director, Center for Suicide Research and Prevention

THE JOSEPH AND FLORENCE MANASTER FOUNDATION CHAIR OF MULTIPLE SCLEROSIS
Established through a gift from the Joseph and Florence Manaster Foundation. Because of his concern for multiple sclerosis patients, and in tribute to the life and memory of his first wife, Florence, Joseph Manaster stipulated in his will that monies he left to the foundation be used to provide compassionate care for people with multiple sclerosis.

Holder: Jacob H. Fox, M.D.
The Joseph and Florence Manaster Foundation Professor of Multiple Sclerosis
Chairman and Professor of Neurological Sciences

1990

THE FRANCES T. AND LESTER B. KNIGHT CHAIR OF GYNECOLOGIC ONCOLOGY
Established through the philanthropy of the Lester B. Knight Charitable Trust, at the direction of Mrs. Frances T. Knight, for the purposes of furthering the diagnosis and treatment of ovarian cancer through education and research. This chair pays tribute to the memory of the late Mr. Knight and recognizes Mrs. Knight for her foresight and commitment to Rush. Furthermore, it is an expression of Mrs. Knight's gratitude to the Medical Center for excellence in patient care and, in particular, to George D. Wilbanks, M.D.

Holder: (the chair is currently unfilled)

1991

THE UNITED PARKINSON FOUNDATION CHAIR IN NEUROLOGICAL SCIENCES
Established in large measure through the philanthropy of the United Parkinson Foundation. The chair pays tribute to the United Parkinson Foundation, which has, through steady support over two decades, helped the Parkinson's disease program at Rush achieve international renown.

Holder: Christopher Goetz, M.D.
The United Parkinson Foundation Professor of Neurological Sciences
Director, Section of Movement Disorders

1992

THE GRAINGER DIRECTORSHIP OF THE RUSH INSTITUTE FOR MENTAL WELL-BEING
Established through the generosity of Trustee David Grainger and his wife, Juli Grainger. This directorship honors the vision and values exemplified in the new initiative represented by the Rush Institutes. It also represents the Graingers' singular dedication to advancing research and treatment in psychiatry.

Holder: Jan Fawcett, M.D.
The Grainger Director, Rush Institute for Mental Well-Being

THE MORTON INTERNATIONAL CHAIR OF ORTHOPEDIC SURGERY
Since the 1940s, when the chairman of Morton Salt, Sterling Morton, joined the Board of Trustees of St. Luke's Hospital, Morton International's top leadership has sustained a commitment to Rush. The Morton International Chair of Orthopedic Surgery was established to benefit the countless individuals who suffer from lower back pain.

Holder: Howard S. An, M.D.
The Morton International Professor of Orthopedic Surgery

THE DR. RALPH AND MARIAN C. FALK CHAIR OF BIOCHEMISTRY
Established through the philanthropy of the Dr. Ralph and Marian C. Falk Medical Research Trust for the purpose of furthering the study of osteoarthritis and cartilage physiology within the Rush Arthritis and Orthopedics Institute. This chair pays tribute to the memory of Dr. and Mrs. Falk and their great commitment to the advancement of patient care through scientific investigation and the exploration of medical science.

Holders: Cheryl B. Knudson, Ph.D.
The Dr. Ralph and Marian C. Falk Professor of Biochemistry
Professor of Pathology

Warren Knudson, Ph.D.
The Dr. Ralph and Marian C. Falk Professor of Biochemistry
Professor of Pathology

THE HENRY P. RUSSE, M.D., DEAN OF RUSH MEDICAL COLLEGE
Established through the philanthropy of Dr. Henry P. Russe's family, friends, students and colleagues for the purpose of providing funds to be used at the discretion of the dean of Rush Medical College. These funds are used to sustain the research of young investigators who are working to establish their careers. This chair pays tribute to the late Dr. Russe for his tireless commitment to the practice of medicine, medical education and administration.

Holders: Thomas A. Deutsch, M.D.
The Henry P. Russe, M.D., Dean of Rush Medical College
Provost, Rush University
Professor of Ophthalmology

Erich E. Brueschke, M.D.
The Henry P. Russe, M.D., Dean of Rush Medical College
Emeritus

THE CROWN FAMILY CHAIR OF ORTHOPEDIC SURGERY
Established through the generosity of the Crown family. The family has a special interest in the area of orthopedics, and their gift established this chair for the study of joint replacement in the Rush Arthritis and Orthopedics Institute.

Holder: Joshua J. Jacobs, M.D.
The Crown Family Professor of Orthopedic Surgery

1993

THE JAMES A. HUNTER, M.D., UNIVERSITY PROFESSORSHIP
This first university-wide professorship was established to recognize and perpetuate outstanding contributions in any discipline, was made possible through the philanthropy of friends, colleagues and grateful patients in honor of the contributions James A. Hunter, M.D., made to medicine as a teacher, mentor and exemplar to thousands of medical students and residents in specialty training.

Holder: Rosalind D. Cartwright, Ph.D.
The James A. Hunter, M.D., University Professor
Professor and Chairman of Psychology and Social Sciences
Founder and Senior Clinician
Rush Sleep Disorder Service and Research Center

THE DR. ANDREW AND PEG THOMSON CHAIR OF INTERNAL MEDICINE
Established to honor Trustee and Rush physician, Andrew Thomson, M.D., and his wife, Peg, a member of the Woman's Board, on the occasion of Dr. Thomson's retirement from active medical practice.

Holder: (the chair is currently unfilled)

THE CHARLES ARTHUR WEAVER CHAIR OF CANCER RESEARCH
Established with a gift from the trust estate of Charles Arthur Weaver, who died in 1941, and who, with his wife, was cared for by physicians at Presbyterian Hospital. The president of the Medical Center, with unanimous approval by the Board of Trustees, determined the Rush Cancer Institute to be a suitable and eloquent memorial to Charles Arthur Weaver, with the philanthropy from the trust estate going for the foreseeable future to provide support for the talents of the current and future faculty of the Institute.

Holder: (the chair is currently unfilled)

THE MARY DENNY WEAVER CHAIR OF CANCER RESEARCH
The second of two research professorships established with a gift from the trust estate of Charles Arthur Weaver. It honors Mr. Weaver's wife, Mary Denny Weaver, who died of complications of cancer. The president of the Medical Center, with unanimous approval by the Board of Trustees, determined the Rush Cancer Institute to be a suitable and eloquent memorial to Mary Denny Weaver.

Holder: (the chair is currently unfilled)

1994

THE C. ANDERSON HEDBERG, M.D., PROFESSORSHIP IN INTERNAL MEDICINE
Established through the philanthropy of Trustee Frederick A. Krehbiel and John H. Krehbiel, Jr., as a perpetual memorial to their father, Life Trustee John Hammond Krehbiel, Sr. The professorship pays a lasting tribute to C. Anderson Hedberg, M.D., friend and primary care physician to Mr. Krehbiel, Sr., acknowledging his excellent and compassionate care and dedication to the clinical practice of medicine and the education of future physicians.

Holder: Brendan M. Reilly, M.D.
The C. Anderson Hedberg, M.D., Professor of Internal Medicine
Chairman, Department of Medicine, John H. Stroger, Jr. Hospital of Cook County
Associate Chairman, Department of Internal Medicine, Rush
Assistant Dean, Rush Medical College

THE GRAINGER DIRECTORSHIP OF THE RUSH ARTHRITIS AND ORTHOPEDICS INSTITUTE
Established by Trustee David Grainger and his wife, Juli Grainger, to provide, in perpetuity, for the innovative patient care programs and important research within the Rush Arthritis and Orthopedics Institute.

Holder: Jorge O. Galante, M.D.
The Grainger Director,
Rush Arthritis and Orthopedics Institute

THE STEVEN G. ECONOMOU, M.D., CHAIR OF GENERAL SURGERY
Established through the philanthropy of the Pritzker Foundation and Trustee Robert A. Pritzker, a friend and grateful patient of Steven G. Economou, M.D. The chair recognizes

Dr. Economou's many accomplishments and ensures such excellence in the field of general surgery will continue at the Medical Center through the recruitment of surgeons with the same dedication to research, patient care and the education of future surgeons as exemplified by Dr. Economou.

Holder: Alexander Doolas, M.D.
The Steven G. Economou, M.D., Professor of General Surgery

THE BRIAN PICCOLO CHAIR FOR CANCER RESEARCH
Established through the philanthropy of the Brian Piccolo Cancer Research Fund and contributions from its largest donor, the National Football League, for the purpose of finding a cure for breast cancer. Upon future discovery of a cure for breast cancer, funds will be directed to areas of research in other cancers.

Holder: Janet Wolter, M.D.
The Brian Piccolo Professor of Cancer Research
Director, Pigmented Lesion Center at the Rush Cancer Institute

1995

THE ABRAHAM M. CHERVONY, M.D. PROFESSORSHIP OF MEDICAL AFFAIRS
The first chair at Rush North Shore Medical Center was established through the philanthropy of Dr. Abraham M. Chervony's family, colleagues, friends and grateful patients. It recognizes his 29 years of service as a caring and skillful physician, teacher and leader at Rush North Shore Medical Center and its predecessor, Skokie Valley Hospital. The chair supports educational programs to nurture the development of promising young physicians.

Holder: Lawrence F. Layfer, M.D.
The Abraham Chervony, M.D., Professor of Medical Affairs
Chairman, Department of Medicine
Rush North Shore Medical Center

THE HARRY J. AND HELEN W. WILLIAMS CHAIR IN CANCER RESEARCH
Established by Harry and Helen Williams' charitable remainder unitrust, this chair advances cancer care and research and honors Harry and Helen Williams for their generosity. With great foresight, Mr. and Mrs. Williams designated the proceeds of the unitrust to help meet the Medical Center's greatest needs, as determined by the Trustees. The Board chose to use the proceeds to fund cancer research in the Rush Cancer Institute.

Holder: (the chair is currently unfilled)

THE FLOYD A. DAVIS, M.D., CHAIR OF NEUROLOGY
This chair was established by friends, patients and admirers of Floyd A. Davis, M.D., to recognize Dr. Davis' tireless devotion to the fight against multiple sclerosis and to provide perpetual funding for innovative research into this illness.

Holder: (the chair is currently unfilled)

THE FRANK R. HENDRICKSON, M.D., CHAIR IN RADIATION ONCOLOGY
Established through the generosity of colleagues, friends, former students and patients, this chair honors Dr. Hendrickson's long and distinguished career at the Medical Center and recognizes the innovations he made in the field of radiation oncology. The chair bearing his name is a fitting tribute to his extraordinary accomplishments, and will carry Dr. Hendrickson's legacy of excellence in radiation oncology forward to new heights in patient care, research and education.

Holder: Ross A. Abrams, M.D.
The Frank R. Hendrickson, M.D., Professor of Radiation Oncology
Chairman, Department of Radiation Oncology

THE JOHN H. AND MARGARET V. KREHBIEL PROFESSORSHIP IN CARDIOLOGY
Established as a perpetual memorial to John H. and Margaret V. Krehbiel by their sons, Trustee Frederick K. and his brother John H., Jr., the professorship recalls the Krehbiels' dedication and service to Rush. It further symbolizes the family's commitment to the prevention and treatment of heart disease within the Rush Heart Institute.

Holder: (the chair is currently unfilled)

THE ANTHONY D. IVANKOVICH, M.D., CHAIR OF ANESTHESIOLOGY
Established by faculty, former students and friends in tribute to Dr. Anthony D. Ivankovich, M.D., for his achievements and contributions to Rush and to the field of anesthesiology, to provide support for basic and clinical research as well as educational initiatives.

Holder: (the chair is currently unfilled)

THE ROGER C. BONE, M.D. , PRESIDENTIAL CHAIR OF RUSH UNIVERSITY
Established by friends and admirers of the late Roger C. Bone, M.D., to pay tribute to him for his tireless commitment to the practice of medicine, medical education, and scientific research.

Holder: (the chair is currently unfilled)

1996

THE RUSH UNIVERSITY CHAIR OF ORTHOPEDIC ONCOLOGY
The Rush University Chair of Orthopedic Oncology was established by grateful patients and admirers of Steven Gitelis, M.D. Generous donors to this chair, which supports ongoing research in bone cancer research, include the Kemper Educational and Charitable Fund and the Thomas B. Hunter III Family.

Holder: Steven Gitelis, M.D.
The Rush University Professor of Orthopedic Oncology
Director, Section of Orthopedic Oncology

THE GRACE DEFOREST AND WILLIAM LOUIS VEECK ENDOWED PROFESSORSHIP IN CARDIOVASCULAR RESEARCH
This chair was established at the direction and through the philanthropy of the grandchildren of William and Grace Veeck: John H. Krehbiel, Jr., Frederick A. Krehbiel II, Michael Veeck, Marya Veeck, Dr. Gregory Veeck, Lisa Veeck, Dr. Juliana Veeck-Brosnan, Christopher Veeck, Peter Raymond Veeck, Ellen Veeck Maggs and William Louis Veeck III. It serves as a perpetual memorial to William and Grace and demonstrates their love of family, their dedication to the city of Chicago and their commitment to the health of the community.

Holder: Richard G. Trohman, M.D
The Grace DeForest and William Louis Veeck Professor of Cardiovascular Research
Director of Electrophysiology Program, Section of Cardiology

THE ALLA V. AND SOLOMON JESMER CHAIR IN AGING
Established through the bequest of Mr. Solomon Jesmer and gifts from stewards of the Rush Institute for Healthy Aging, this chair is an enduring tribute to Mr. Jesmer and his late wife, Alla, who received care at the Johnston R. Bowman Health Center for the Elderly during their last years. Mr. Jesmer had a deep interest in advancing research in the fields of gerontology and geriatric medicine at Rush.

Holder: Elliott J. Mufson, Ph.D.
The Alla V. and Solomon Jesmer Professor in Aging

THE RONALD L. DEWALD, M.D., ENDOWED CHAIR IN SPINAL DEFORMITIES
Established as the first endowed chair in the country devoted solely to research in spinal deformities, the chair honors Ronald L. DeWald, M.D., a pioneer in modern spine surgery. Dr. DeWald's colleagues, former students and grateful patients contributed to the chair, which was launched by a significant gift from Sofamor Danek Group, Inc., a manufacturer of spinal implant materials.

Inaugural Holder: John P. Lubicky, M.D.
The Ronald L. DeWald, M.D., Professor in Spinal Deformities
Chief of Staff, Shriners Children's Hospital

THE JORGE O. GALANTE, M.D., D.M.Sc., CHAIR IN ORTHOPEDIC SURGERY
Established through the philanthropy of friends, grateful patients and colleagues from around the world to recognize the profound impact Jorge O. Galante, M.D., D.M.Sc., has had on the field of orthopedic surgery. The chair will support, in perpetuity, important orthopedic research that will ensure that future generations continue to receive the most appropriate and up-to-date treatments of orthopedic disorders, carrying on Dr. Galante's tradition of excellence in patient care and research.

Holder: Tibor Glant, M.D., Ph.D., D.Sc.
The Jorge O. Galante, M.D., Professor of Orthopedic Surgery
Professor of Biochemistry, Internal Medicine and Orthopedic Surgery

THE A. WATSON ARMOUR III AND SARAH ARMOUR PRESIDENTIAL PROFESSORSHIP
The Trustees of Rush-Presbyterian-St. Luke's paid special tribute to their late colleague, A. Watson Armour III, and to his loving wife and confidante, Sarah Wood Armour, by establishing this chair. This endowed professorship was created to formally recognize Mr. Armour who, with foresight and generosity, through his estate and the A. Watson Armour III Charitable Lead Trust, made the Medical Center the recipient of a magnificent endowment to provide philanthropy for professorships, fellowships, scholarships and research.

Holder: Roy A. E. Bakay, M.D.
The A. Watson Armour III and Sarah Armour Presidential Professor
Professor of Neurosurgery
Vice Chairman, Department of Neurosurgery

THE ALICE PIRIE WIRTZ PROFESSORSHIP OF MEDICAL ONCOLOGY
The chair recognizes excellence in cancer treatment and research and was made possible through the generosity of Alice and William Wirtz - a family with longtime ties to the Medical Center and a deep commitment to supporting the health and well-being of the community. In creating this chair, Mr. and Mrs. Wirtz honor physicians like Philip D. Bonomi, M.D., who bring innovative research to the bedside every day. By establishing this endowed professorship, Mr. and Mrs. Wirtz hope that this aggressive approach to oncology research will continue.

Holder: Philip D. Bonomi, M.D.
The Alice Pirie Wirtz Professor of Medical Oncology
Director, Section of Medical Oncology

THE NURSES ALUMNI ASSOCIATION CHAIR IN HEALTH AND THE AGING PROCESS
Established through the generosity of the Rush-Presbyterian-St. Luke's Nurses Alumni Association, nursing faculty and friends, this chair is dedicated to providing a base of financial support which will enable nurses to answer research questions and develop strategies to keep people healthy as they age. It is only the second chair in the country established by an alumni association for nursing.

Holder: Carol Farran, D.N.Sc.
The Nurses Alumni Association Professor in Health and the Aging Process

1997

THE GEORGE D. WILBANKS, M.D., ENDOWED CHAIR IN GYNECOLOGIC ONCOLOGY
The Wilbanks Chair was made possible through a $500,000 matching grant from the Lester B. Knight Charitable Trust. Significant contributions were also received from Dr. Wilbanks' patients and colleagues. The chair provides funding for research in ovarian cancer, with the hope of some day finding a cure for this disease.

Holder: Jacob Rotmensch, M.D.
The George D. Wilbanks, M.D., Professor of Gynecologic Oncology
Director, Section of Gynecologic Oncology

THE DEUTSCH FAMILY PROFESSORSHIP OF OPHTHALMOLOGY
Established through the generosity of the Deutsch family, grateful patients, current faculty and employees of the Department of Ophthalmology, and former ophthalmology residents, this chair recognizes more than 65 years of unequaled service to the Medical Center in the delivery of patient care, the education of students and residents, and the scientific investigation of diseases of the eye from three generations of one family of Rush ophthalmologists, Drs. Emil, William and Thomas Deutsch.

Holder: Jonathan B. Rubenstein, M.D.
The Deutsch Family Professor of Ophthalmology
Chairman, Division of Ophthalmology
Rush North Shore Medical Center

THE DEBORAH R. AND EDGAR D. JANNOTTA PRESIDENTIAL PROFESSORSHIP
Established through the Mr. and Mrs. Jannotta's lead gift to the Campaign for Rush and the proceeds of a philanthropic tribute to Edgar D. Jannotta from the firm and various partners of William Blair and Company, LLC, upon Mr. Jannotta's retirement as that company's managing partner, this Presidential Professorship was created to recognize Debby and Ned Jannotta for their unequaled tradition of stewardship, generosity of spirit and exceptional personal philanthropy to Rush University Medical Center.

Holder: (the chair is currently unfilled)

1998

THE JUDD AND MARJORIE WEINBERG PRESIDENTIAL PROFESSORSHIP
Established through the generosity of the Judd A. and Marjorie Weinberg Family Foundation, this presidential professorship may be held by faculty members from any discipline, chosen at the president's discretion. It was the Weinberg family's desire that Jules E. Harris, M.D., be recognized for his outstanding achievements in patient care and medical research.

Holder: Jules E. Harris, M.D.
The Judd and Marjorie Weinberg Presidential Professor
Section of Medical Oncology

THE MARIA ALBANESE PRESIDENTIAL PROFESSORSHIP IN BREAST CANCER RESEARCH
Established through the bequest of Maria Albanese, this presidential professorship is held by a faculty member at the discretion of the president. Miss Albanese chose to direct the proceeds of her estate to Rush as an expression of her deep admiration of Edgar Staren, M.D. and Melody Cobleigh, M.D., and her gratitude for the care she received from them. Miss Albanese requested that the professorship exclusively support activities which advance scientific knowledge in the area of breast cancer research.

Holder: Melody A. Cobleigh, M.D.
The Maria Albanese Presidential Professor of Breast Cancer Research
Director, Rush Comprehensive Breast Center
Director, Rush Susceptibility to Cancer Program (RCIP)

1999

THE ROBERT S. KATZ, M.D. - JOAN AND PAUL RUBSCHLAGER PRESIDENTIAL PROFESSORSHIP IN OSTEOARTHRITIS RESEARCH
Established through the generosity of long-time Rush supporters, Joan and Paul Rubschlager, who wished to honor Robert S. Katz, M.D., for the superb care he has provided. It was the Rubschlagers' desire that the first use of the chair be in the area of osteoarthritis.

Holder: Richard F. Loeser, M.D.
The Robert S. Katz, M.D.-Joan and Paul Rubschlager Presidential Professor in Osteoarthritis Research
Section of Rheumatology and Department of Biochemistry

2000

THE MARY LOU BELL McGREW PRESIDENTIAL PROFESSORSHIP FOR MEDICAL RESEARCH
Established by the Board of Trustees to recognize the memory and generosity of nursing alumna Mary Lou Bell McGrew (St. Luke's Hospital School of Nursing, Class of 1934), income from this presidential chair will help further scientific investigation to improve the quality of life for all mankind. Through her estate, Mrs. McGrew directed that a perpetual trust be created at Citizens National Bank of Paris, Illinois, for the sole benefit of the Medical Center. Net income from this $3 million trust is divided equally between medical research and indigent care.

Holder: Dale Richman Sumner, Jr., Ph.D.
The Mary Lou Bell McGrew Presidential Professor for Medical Research
Professor and Chairman, Department of Anatomy
Associate Professor, Orthopedic Surgery

2001

THE LESTER AND MURIEL ANIXTER PROFESSORSHIP IN NEPHROLOGY
Established by the Board of Trustees to recognize the philanthropic investment by Mr. and Mrs. Lester J. Anixter in the health and well-being of patients with kidney disease. The chair also recognizes the Anixters' support for the Medical Center's physician-scientists, in particular, Janis Orlowski, M.D.

Holder: Stephen M. Korbet, M.D.
The Lester and Muriel Anixter Professor of Nephrology
Associate Director, Section of Nephrology

2002

THE GLORE FAMILY CHAIR IN NEONATOLOGY
Established by the Board of Trustees to recognize the philanthropy of Trustee Robert Hixon Glore and his family. Four generations of Hixons and Glores have been associated with the Medical Center and its predecessor institution, St. Luke's Hospital. The family wished to support patient care, education and research in neonatology, including the study of infant brain function through the chair, and chose the timing of their gift to express confidence in and support of the new president and chief executive officer of Rush, Larry J. Goodman, M.D.

Holder: (the chair is currently unfilled)

2004

THE MADELEINE AND JAMES M. McMULLAN - CARL E. EYBEL, M.D., CHAIR OF EXCELLENCE IN CLINICAL CARDIOLOGY
Established by the Board of Trustees to recognize the philanthropy of Mr. and Mrs. James M. McMullan and to honor the career of Carl E. Eybel, M.D., for his exemplary skills as a clinician and as a teacher of fellows, residents and medical students. Dr. Eybel has been Mr. McMullan's personal physician for many years.

Holder: Philip R. Liebson, M.D.
The Madeleine and James M. McMullan - Carl E. Eybel, M.D., Professor of Excellence in Clinical Cardiology

Faculty Listing by Department

Departments

- Adult Health Nursing
- Anatomy and Cell Biology
- Anesthesiology
- Biochemistry
- Cardiovascular Thoracic Surgery
- Clinical Laboratory Sciences
- Clinical Nutrition
- Communication Disorders and Sciences
- Community and Mental Health Nursing
- Dermatology
- Diagnostic Radiology
- Emergency Medicine
- Family Medicine
- General Surgery
- Health Systems Management
- Immunology/Microbiology
- Internal Medicine
- Medical Physics
- Molecular Biophysics and Physiology
- Neurological Sciences
- Neurosurgery
- Obstetrics and Gynecology
- Occupational Therapy
- Ophthalmology
- Orthopedic Surgery
- Otolaryngology and Bronchoesphaology
- Pathology
- Pediatrics
- Pharmacology
- Physical Medicine and Rehabilitation
- Plastic and Reconstructive Surgery
- Preventive Medicine
- Psychiatry
- Psychology
- Radiation Oncology
- Religion, Health and Human Values
- Urology
- Vascular Ultrasound
- Women's and Children's Health

Adult Health Nursing

Faut-Callahan, Margaret
Professor, Chair
Aizenstein, Shirley
Complemental Faculty
Akre, David A.
Instructor
Alfafara, Araceli
Complemental Faculty
Andreoli, Kathleen G.
Professor
Atha, Mary M.
Complemental Faculty
Barnicle-McIntosh, Madeline M.
Complemental Faculty
Barry-Coveny, Sara B.
Complemental Faculty
Batty, Karen Nancy
Instructor
Borkgren, Marilyn
Associate
Borkgren, Marilyn W.
omplemental Faculty
Bosek, Marcia
Associate Professor
Braun, Lynne T.
Associate Professor
Brown, Frederick M.
Associate
Brozenec, Sally
Assistant Professor
Buelow, Janice
Associate
Camilleri, Rosemary
Associate
Carlson, Elizabeth
Associate Professor
Casey, Ginny Mary
Instructor
Chapman, Dianne D.
Associate
Christopher, Beth-Anne
Instructor
Cleary, Jennifer K.
Complemental Faculty
Cleary-Santino, Ann Marie
Instructor
Cochran, Lynn
Associate
Corbridge, Susan
Associate
Crandall-Casey, Sharon
Complemental Faculty
Crieger, Cathleen
Associate
Curigan, Linda
Associate
Czurylo, Kathy
Associate
Dall, Carol J.
Associate
Denny, Mary Schemper
Associate
Di Filippo, Judith A.
Complemental Faculty
Dillon, Paula
Assistant Professor
Dolce, Amy D.H.
Complemental Faculty
Doubek, Ann A.
Complemental Faculty
Dougherty, Janet Kay
Instructor
Downie, Patrick
Associate
Drozd, Carol Ann
Associate
Duda, David
Complemental Faculty
Duros-Silber, June
Complemental Faculty
Dwyer, Eileen M.
Instructor
Egging, Darcy
Associate
Ehrlich-Jones, Linda E.
Associate
Einhorn, Carol J.
Associate
Ellsworth, Mary J.
Associate
Elpern, Ellen H.
Assistant Professor
Eriksson, Joann H.
Associate
Farwell, Liz
Associate
Feingold, Deborah J.
Complemental Faculty
Ferry-Rooney, Raechel M.
Complemental Faculty
Flaherty, Stephen Anthony
Complemental Faculty
Flint, Nora
Complemental Faculty
Flood, Suzanne M.
Instructor
Frogge, Margaret Hansen
Associate
Fruth, Roberta A.
Associate
Gardiner, Deborah Irene
Instructor
Garrett, Kim Noreen
Assistant Professor
Gaynor, Sandra E.
Associate
Goodman, Michelle
Assistant Professor
Grady, Kathleen L.
Associate Professor
Grady, Kathleen L.
Professor
Gregus, Margaret
Complemental Faculty
Guido, Barbara
Complemental Faculty
Gulczynski, Barbara B.
Associate
Hancock, Beverly J.
Instructor
Herlehy, Anne Marie
Instructor
Hickey, Margaret
Associate
Hicks, Franklin D.
Associate Professor
Hinch, Barbara Kitzes
Assistant Professor
Hirsch, Debra A.
Complemental Faculty
Holden, Joan
Complemental Faculty
Hollinger-Smith, Linda
Associate Professor
Howland-Gradman, June
Complemental Faculty
Huerta, Susan
Complemental Faculty
Jacobs, Frances A.
Associate
Jagmin, Marianne
Associate
Kamajian, Margaret, F.
Complemental Faculty
Kamp, Sandra J.
Associate
Keenan, Ann Marie
Assistant Professor
Keithley, Joyce
Professor
Kemp, Mildred G.
Complemental Faculty
Kissane, Kevin Patrick
Instructor
Kleinpell, Ruth M.
Associate Professor
Kociak, Kathleen A.
Associate
Kohn, Carol L.
Associate
Kortes, Kimberly A.
Instructor
Kraman, Ruth
Instructor
Kremer, Michael John
Associate Professor
Krickl, Donna K.
Complemental Faculty
Lamb, Karen
Associate Professor
Lapidos, Stan
Instructor
Larson, Susan J.
Instructor
Larson, Susan Joy
Instructor
Lauer, Mary Kathryn
Assistant Professor
Leach, Deanna
Complemental Faculty
Llewellyn, Jane
Associate Professor
Lokos, Constance
Associate
Luc, Laura A.
Associate
Lydon, Jean T.
Complemental Faculty
Manson, Sharon K.
Associate
Marino, Keith A.
Instructor
Martin, Barbara
Assistant Professor
Matthiesen, Valerie
Associate Professor
Maushard, Andrea
Associate
McCann, Judith
Associate Professor
Mendelson, Lisa Sigg
Instructor
Merritt, Sharon Louise
Associate
Meyer, Nancy
Complemental Faculty
Micek, Wendy Tuzik
Complemental Faculty
Milano, Rose
Associate
Miller, Joanne M.
Assistant Professor
Minnick, Ann M.
Professor
Morreale, Barbara
Complemental Faculty
Murphy, Anna Zander
Associate
Murphy, Marcia
Assistant Professor
Myers, Donna
Associate
Myers, Donna W.
Associate
Pfeifer, Pamela
Complemental Faculty
Phillips, Marcia Ann
Assistant Professor
Piasecki, Patricia A.
Assistant Professor
Podolski, Janice L.
Assistant Professor
Przygodzka, Renee B.
Instructor
Pugliese, Gina
Associate
Quigley, Laura R.
Assistant Professor
Quinn, Lauretta T.
Associate
Ramirez-Morgen, Luz Maria
Complemental Faculty
Rehwaldt, Maureen
Complemental Faculty
Renda, Jolene Rietfort
Associate
Richard-Smith, Angelique L.
Associate
Roberts, Kathryn
Complemental Faculty

Rodts, Mary M.
Assistant Professor
Rogers, Jill K.
Instructor
Rogovin, Caleb A.
Complemental Faculty
Saba, Mary T.
Instructor
Schillo, Richard
Associate
Schuch-Davis, Joanne M.
Instructor
Schwelnus, Erika Margaret
Instructor
Shekleton, Maureen
Associate
Shephard, Rebekah
Instructor
Sipes, Carolyn
Associate
Sivertsen, Lynn I.
Assistant Professor
Slowikowski, Rosemarie D.
Instructor
Smart, Kathryn A.
Assistant Professor
Smyrniotis, Colleen Marie
Associate
Spector, Nancy M.
Associate
Spevacek, Ann Harvey
Associate
Staffileno, Beth Ann
Assistant Professor
Stegmaier, Jo Ann
Complemental Faculty
Stewart-Haapoja, Irene E.
Complemental Faculty
Stupay, Susan
Instructor
Suhayda, RoseMarie
Assistant Professor
Swanson, Barbara A.
Assistant Professor
Swarzman, Penelope
Complemental Faculty
Tanabe, Paula
Associate
Tarnow, Jane
Complemental Faculty
Tess, Maureen M.
Associate
Thomas, Charlene
Instructor
Toperoff, Will
Associate
Tordecilla, Lydia
Assistant Professor
Uebele, Joan A.
Instructor
Vuckovic, Karen
Associate
Walton, Jane C.
Assistant Professor
Waszkiewicz, Margaret
Instructor
Werhane, Mary Jo U.
Complemental Faculty
Wickham, Rita
Associate Professor
Wilens, Nancy
Instructor
Winkelman, Lois
Instructor
Witt, Mary Ellyn
Complemental Faculty
Yermal, Stephen J.
Associate
Yocom, Carolyn J.
Associate
Zbilut, Joseph P.
Professor
Zeller, Janice M.
Professor

Anatomy and Cell Biology

Sumner, Dale R., Jr.
Professor, Chair
Al-Ghoul, Kristin J.
Assistant Professor
Beck, Robert J.
Instructor
Cole, Ada A.
Associate Professor
Cole, Brian Alexander
Associate Professor
Cole, Brian J.
Assistant Professor
Galante, Jorge O.
Professor
Hughes, W. Franklin
Associate Professor
Hurwitz, Debra E.
Assistant Professor
Jacob, Susan K.
Assistant Professor
Kerns, James M.
Professor
Khodadad, Jena
Associate Professor
Kuszak, Jerome R.
Associate Professor
Leven, Robert M.
Assistant Professor
Maibenco, Helen
Emeritus
Mao, Jeremy J.
Visiting Associate Professor
Moisio, Kirsten
Instructor
Muehleman, Carol
Professor
Novak, Gertrude M.
Instructor
Rawlins, Richard
Professor
Seale, Raymond
Emeritus
Sena, Kotaro
Instructor
Smith, Claire S.
Assistant Professor
Virdi, Amarjit
Assistant Professor
Williams, James M.
Professor

Anesthesiology

Ivankovich, Anthony
Professor, Chair
Adkison, Michael G.
Assistant
Amin, Sandeep D.
Assistant Professor
Andres, Rosemarie E.
Assistant Professor
Badrinath, Shyamala K.
Associate Professor
Bailey, Todd
Assistant
Barnes, Steven D.
Assistant Professor
Behnia, Rahim
Professor
Belvis, Dawn Olay
Assistant
Bhandari, Angelina Devi
Assistant Professor
Biala, Joel Roldan
Assistant Professor
Birmingham, Brian W.
Assistant Professor
Blum, Steven L.
Assistant Professor
Borboa, Tony B.
Assistant
Botvinick, Brad
Braverman, Berton
Assistant Professor
Brenner, Tamara J.
Assistant Professor
Brown, Douglas V.
Instructor
Budac, Stefan
Assistant
Burmeister, Todd R.
Assistant
Buvanendran, Asokumar
Assistant
Candido, Kenneth D.
Assistant Professor
Casey, Matthew Joseph
Croley, William Christopher
Czinn, Edward A.
Assistant Professor
Dadabhoy, Zerin P.
Assistant Professor
Das, Sanghamitra
Instructor
Davis, Felicia A.
Assistant Professor
Diaz-Franco, Carlo
Associate Professor
Djordjevich, Ljubomir
Assistant Professor
El Ganzouri, Abdel R.
Associate Professor
Elborno, Ahmed
Assistant
Feinstein, Lowell B.
Assistant Professor
Ford, Erica W.
Assistant Professor
Ghaem-Maghami, Massoud
Assistant Professor
Girard, Scott Andrew
Goetz, Gregory Lee
Assistant
Goldschmidt,Tammara Sue
Assistant
Gramlich, Lisa
Assistant Professor
Guiao, Candido M. Jr.
Assistant
Hawkins, Richard Alfred
Assistant
Heller, Floyd N.
Associate Professor
Heymann, Harold
Associate Professor
Hubley, Robert Leighton
Assistant
Hussein, Yasser
Instructor
Irfan, Kashif
Assistant
Iusco, Arcangelo Michele
Assistant
Iyer, Lakshmi
Instructor
Javier, Darvin Johnson
Assistant
Joseph, Nirmal J.
Assistant
Joshi, Nirmal
Assistant
Katcher, Kelly Renee
Assistant
Katsoyannis, George D.
Assistant Professor
Keh-Wong, Elisa S.
Assistant Professor
Kerchberger, John P.
Assistant Professor
Khavkin, Albert
Assistant
Khorasani, Arjang
Assistant Professor
Kroin, Jeffrey S.
Professor
Krolick, Thomas J.
Assistant Professor
Lai, Joseph C.
Assistant Professor
Lane, Phillip E.
Assistant Professor
Lin, James Thomas
Assistant
Lindahl, Matthew Werner
Ljubanovic, Lazarevic
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Manuel, Christopher
Assistant Professor
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Assistant Professor
Meister, Michael D.
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Mejzak, Ronald Vincent
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Instructor
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Mitter, Nanhi Rani
Morris, Cindy L.
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Associate Professor
Nath, Heather Anne
Assistant Professor
Nguyen, Michael
Assistant
Nguyen, Tri Van
Assistant
Nimmagadda, Usharani
Assistant Professor
Noel, Michael Gerard
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O'Connor, Christopher
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Oliveira, Blasco M.A.
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Patel, Hina H.
Assistant
Patel, Parag Dinesh
Assistant
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Perry, Patricia M.
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Assistant Professor
Quiros, Emily Mathis
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Reddy, Chandra B.
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Rothenberg, David M.
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Sekhadia, Mehul Premji
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Sharma, Samir
Assistant
Shulman, Morton
Professor
Skinner, Cody Anne
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Sklar, David Jonathan
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Soong, Wayne
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Tuman, Kenneth J.
Professor
Tuman, Mary T.
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Underwood, Erin Douglas
Assistant
Venugopal, Kottarathil
Assistant Professor
Wahl, Cora
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Wieslaw, Podlasek
Assistant
Wolowick, Mark J.
Wu, Dickson S.
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Yastrow, Edward S.
Assistant Professor
Yuk, Jin Hyok
Assistant
de Castro, Jennifer
Assistant

Biochemistry

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Basheeruddin, Khaja
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Berry-Kravis, Elizabeth
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Bezkorovainy, Anatoly
Professor
Blazek, Ed Robert
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Block, Joel A.
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Casey, Rachael
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Zaneveld, Lourens
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Cardiovascular Thoracic Surgery

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Starr, Joanne P.
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Clinical Laboratory Sciences

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Groth, Christine A.
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Kolakji, Mohamad Ghiath
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Moy, Michelle
Instructor
Pickering, Cynthia Marie
Instructor
Prod, Michele
Instructor
Radtke, Joan
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Salah, Mohammad Yunes
Sanders, D. Bradford
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Travers, Tom
Instructor
Tsarovsky, Gary
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Vassos, Christine G.
Instructor
Verma, Punam
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Zeibig, Elizabeth
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Clinical Nutrition

Dowling, Rebecca A.
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Instructor
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Goynshor, Andrea
Instructor
Grief, Sophie Ares
Instructor

Gustashaw, Kristin A.R.
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Llanes, Antonieta G.
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Pool, Ellis
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Instructor
Rezabek, Karen
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Rondinelli, Lara Marie
Instructor
Ruzicka, Karen Harbeitner
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Sanoy, Arlene Olea
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Spooner, Mary Margaret
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Stefan, Teresa Maria
Instructor
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Instructor

Communication Disorders and Sciences

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Killion, Mead
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Community and Mental Health Nursing

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Bavis, Margaret Perlia
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Brooks, Michael
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Smith, Diane Yeager
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Swartwout, Kathryn
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Dermatology

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Chan, I-Ja
Assistant Professor
Charles, Alix Jude, Jr.
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Dy, Lady C.
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Ertle, James O.
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Gehlmann, Louisa M.
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Hunt, Steven Wesley
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Kalis, John B.
Assistant Professor
Keane, John T.
Assistant Professor
Levitt, Leonard
Assistant Professor
Liermann, Kelle Sue
Assistant
Malkinson, Frederick
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Marshall, Stephanie C.
Assistant
Massa, Mary C.
Professor
Moore, Julie Anne
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O'Donoghue, Marianne N.
Associate Professor
O'Donoghue, Michael Kevin
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Associate Professor
Remlinger, Kathleen
Associate Professor
Rhodes, Arthur R.
Professor
Rosenbaum, Marjorie M.
Assistant Professor
Stockton, Donna L.
Assistant Professor
Strohl, Lee H.
Assistant Professor
Wyhinny, Patricia
Assistant Professor

Diagnostic Radiology

Turner, David A.
Professor, Chair (Acting)
Ackerman, Laurens V.
Professor
Akrami, Jason Ashkan
Assistant
Ali, Amjad
Professor
Alonzo, Marc
Assistant Professor
Archibald, Steven A.
Assistant Professor
Baladad, Juanito T.
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Barton, John T.
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Berlin, Leonard
Professor
Byrd, Sharon E.
Professor
Cardwell, Anne Byrne
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Cavallino, Robert P.
Professor
Chang, Wei
Professor
Charania, Munira
Assistant
Charters, John R.
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Chen, Meri E.
Assistant
Comiskey, Elizabeth M.
Assistant Professor
Corbridge, Carol
Assistant Professor
Courtney, John V.
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Dieschbourg, Janice
Assistant Professor
Eisenstein, Matthew M.
Instructor
Epstein, Avrum J.
Instructor
Freimanis, Maija
Associate Professor
Gueyikian, Sebouh Abraham
Assistant Professor
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Huckman, Michael S.
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Jhaveri, Miral D.
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Kumar, Manish M.
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Lopes, Demetrius K.
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Matthew, Guy R.
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Minkus, Kirk Douglas
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Mollihan, William V.
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Novetsky, Gary J.
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Patel, Nilesh H.
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Patel, Suresh K.
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Racenstein, Michael J.
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Professor
Schmidt, Kenneth D.
Assistant Professor
Schreiner, Virginia Carol
Assistant Professor
Sclamberg, Joy Suzanne
Assistant Professor
Smith, Claire S.
Professor
Solmos Jr, Gene Robert
Assistant Professor
Sternberg, James Marsh
Assistant Professor
White, Gregory Mitchell
Assistant
Whitehouse, Jeffrey J.
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Emergency Medicine

Simon, Robert R.
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Aguinaldo, Maria
Instructor
Atluri, Indira
Instructor
Badrov, Nancy
Instructor
Bayram, Jamil D.
Assistant Professor
Belden, Matthew Daniel
Instructor
Belmont, Daniel
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Bowman, Steven H.
Assistant Professor
Brawka, Joseph Julius
Instructor
Chai, Austen-Kum
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Chiampas, George T.
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Clayton, Galeta Carolyn
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Couture, Eileen Frances
Assistant Professor
Feldman, Robert J.
Assistant Professor
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Greene, Constance S.
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Grossman, Lauren S.
Assistant Professor
Gussow, Leon M.
Assistant Professor
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Husain, Mumataz
Instructor
Hussain, Mumtaz Shaik
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Kern, Kevin P.
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Assistant Professor
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Instructor
Nasr, Isam
Assistant Professor
Ohlfs, Rachel E.
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Palivos, Lisa Routsolias
Assistant Professor
Patwari, Rahul G.
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Penny, Don W.
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Instructor
Pilch, Liza Marie
Instructor
Purim-Shem-Tov, Yanina A.
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Roberts, Rebecca R.
Assistant Professor
Rosenberg, Alan S.
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Assistant Professor
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Family Medicine

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Assistant Professor
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Assistant Professor
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Brown, Max Douglas
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Instructor
Kring, Gina Lynn
Instructor
Kruckmeyer, Warren G.
Instructor
Kungl, Paul A.
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Instructor
Mahone, Sylvia R.
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Professor
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Instructor
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Instructor
Martz, Deborah M.
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Mayerhofer, Kenneth E.
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Assistant Professor
Nelson, Thomas M.
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Weisberger, Lise
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General Surgery

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Fatima, Siddiqui Kiran
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Field-Chez, Michelle Ann
Assistant
Fine, Martin
Assistant Professor
Fink, Peter
Assistant Professor
Fisch, James M.
Assistant Professor
Gable, Leslie
Instructor
Garrelts, Deborah Lynne
Instructor
Gehrie, Mark J.
Assistant Professor
Gierl, Benedict L.
Assistant Professor
Gokhale, Sudhir M.
Instructor
Golbin, Alexander Z.
Instructor
Golchini Shafa, Mehdi
Complemental Faculty
Goldberg, Arnold I.
Professor
Goldfarb, Edward
Assistant Professor
Goldstein, Corey N.
Instructor
Greene, Stuart C.
Assistant Professor
Gruenberg, Linda
Assistant Professor
Grunes, Dorothy T.
Instructor
Gupta, Saisha
Assistant
Gupta, Sharad
Assistant
Gutmann, Miriam B.
Assistant Professor
Ha, Yong Soo
Instructor
Halper, Ira S.
Assistant Professor
Harris, Charles R.
Instructor
Hartlage, Ann S.
Assistant Professor
Hartman, Edith
Instructor
Haycraft, Daniel Martin
Instructor
Higgins, Aileen E.
Assistant
Hirsch, Alan R.
Assistant Professor
Holemon, Lance D.
Instructor
Holinger, Paul C.
Professor
Hristea, Hariclia E.
Assistant
Huh, John
Instructor
Hulcher, Julia M.
Instructor
Husfeldt, Brenda A.
Assistant Professor
Hussain, Ahmed M.
Instructor
Jaffe, Charles M.
Assistant Professor
Jiron, Arnoldo J.
Assistant Professor
Johnson, Kathleen H.
Instructor
Johnson, Margery R.
Assistant Professor
Jones, Frank A. D.
Assistant Professor
Kachoris, Paul J.
Assistant Professor
Kanner, Andres
Assistant Professor
Kelly, Jonathan
Assistant Professor
Khoury, Philip F.
Assistant
Kluft, Richard P.
Visiting Associate Professor
Koziol, Donald J.
Assistant Professor
Kraus, Louis J.
Associate Professor
Kravitz, Howard
Associate Professor
Krawczyk, John G.
Instructor
Kut, Joseph L.
Assistant Professor
Lammers, Steven
Assistant Professor
Lane, Harold J.
Instructor
Larson, John K.
Assistant Professor
Lee Chuy, Ismael
Instructor
Leff, Joel R.
Instructor
Levin, Daniel Eric
Assistant Professor
Levitan, Kenneth M.
Assistant Professor
Lewinbuk, Dan David
Instructor
Lewis, Rita
Instructor
Libert, Samuel A.
Complemental Faculty
Litowitz, Bonnie E.
Visiting Associate Professor
Lopez, Regina Rosa
Assistant
Luke, Luckose M.
Instructor
Ma, Albert
Instructor
Mangoubi, Elie
Instructor
Marri, Bharathi R.
Instructor
Martin, Ernesto L.
Assistant Professor
Mattera, Tina Marie
Instructor
McMiller, William P.
Instructor
Meaden, Patricia M.
Assistant Professor
Mehlinger-Mitchell, Renee
Assistant Professor
Meiszner, John W.
Instructor
Mershon, Steven
Assistant Professor
Miles, William Scott
Instructor
Moolayil, Kumar D.
Instructor
Morrison, Caroline M.
Instructor
Morrison, David
Assistant Professor
Mueller, Patricia A.
Assistant Professor

Notorangelo, Michael P.
Assistant Professor
Nutenko, Victor E.
Instructor
Okuleye, Babatunde Gbalade
Assistant
Olsen, Joann Marie
Instructor
Ong, Jason C.
Assistant
Paidi, Ramachandra R.
Instructor
Patel, Minaldevi
Assistant Professor
Patterson, Joan E.
Assistant Professor
Pecen, Nancy E.
Instructor
Pieper, William J.
Assistant Professor
Pierce, Karen
Assistant Professor
Pirec, Vesna
Assistant Professor
Pisani, Vincent D.
Assistant Professor
Plyler, Brett Charles
Assistant
Poznanski, Elva
Professor
Putnam, Frank W.
Visiting Associate Professor
Rafeyan, Roueen
Instructor
Rattan, Pradeep
Instructor
Reifman, Robert A.
Assistant Professor
Reinstein, Michael J.
Assistant Professor
Ripeckyj, Andrew
Assistant Professor
Rose, Robert Marc
Visiting Professor
Rosenmutter, Gary M.
Instructor
Rosenthal, Ruth Beth
Instructor
Ross, Jeffrey S.
Instructor
Sachs, Roberta
Assistant Professor
Samelson, Charles F.
Assistant Professor
Sandrolini, Marc C.
Assistant Professor
Scheftner, William A.
Associate Professor
Schell, Nancy P.
Instructor
Schiff, Daniel
Assistant Professor
Shah, Kavita
Assistant Professor
Shan, Tanveer H.
Instructor
Shelby, Dennis R.
Assistant Professor
Shulman, Robert B.
Instructor
Shvartsman, Leonid
Instructor
Siegel, Allen M.
Assistant Professor
Siegel, Glenn
Instructor
Siegel, Irwin
Assistant Professor
Singh, Haramandeep
Assistant Professor
Sobel, Hollie M.
Instructor
St. Clair, Doris E.
Assistant Professor
St. Pierre, Aimee C.
Assistant Professor
Stampley, Jan O.
Instructor
Stotland, Nada
Professor
Strayhorn, Earlene E.
Instructor
Strozier, Charles P
Visiting Assistant Professor
Tavares, Alexandre Garcia
Assistant
Thampy, Kishore J.
Assistant Professor
Tibbetts, Mary W.
Instructor
Tinwalla, Abdi Yusufali
Assistant
Tracy, Katherine Ann
Instructor
Trakas, Demetrius A.
Assistant Professor
Vazquez, Juan J.
Emeritus
Viner, Jesse
Assistant Professor
Vivar, Zenaida
Instructor
Voltolina, Eugene J.
Instructor
Wahlstrom, Carl M., Jr.
Assistant Professor
Wasyliw, Orest
Assistant Professor
WeInstructorein, Steven Louis
Instructor
Westheimer, Ruth
Assistant Professor
Wilson, Burgess Christianse
Assistant
Wuest, Ronald Jay
Instructor
Yballe, Sonia B.
Assistant Professor
Young, Michael
Associate Professor
Yuen, Tammy Szewan
Assistant
Zadylak, Robert G.
Assistant Professor
Zajecka, John M.
Associate Professor

Psychology

Cartwright, Rosalind D.
Professor, Chair
Aber, William R.
Assistant Professor
Anderson, David R.
Assistant Professor
Aschkenasy, Jean R.
Assistant Professor
Balthazor, Michael
Assistant Professor
Behel, Jay Matthew
Assistant Professor
Bernard, Bryan A.
Assistant Professor
Berry, Robert A.
Assistant Professor
Burgess, Helen J.
Assistant Professor
Chrenka, Rosalyn A.
Assistant Professor
Clark, David C.
Professor
Cline, Daniel J.
Assistant Professor
Comella, Cynthia L.
Associate Professor
Corsica, Joyce A.
Assistant Professor
Cuevas, Jorge L.
Visiting Assistant Professor
Cuevas-Becerini, Jorge
Visiting Assistant Professor
Daugherty, Steven R.
Assistant Professor
Davis, Amy V.
Assistant Professor
Domanico, Rocco J.
Lecturer
Eastman, Charmane
Professor
Echevarria, Fidel
Instructor
Everson-Rose, Susan A.
Associate Professor
Fleischman, Debra A.
Assistant Professor
Fogg, Louis F.
Assistant Professor
Garron, David C.
Emeritus
Gauthier, Janine E.
Assistant Professor
Gilley, David W.
Assistant Professor
Goodman, Daniel J.
Instructor
Grote, Christopher L.
Associate Professor
Hanson, Katherine M.
Assistant Professor
Hartlage, Ann S.
Assistant Professor
Herdegen, James
Assistant Professor
Hoeppner, Jo-Ann L. B.
Visiting Assistant Professor
Johnson, Marilyn A.
Emeritus
Jung-Beeman, Mark E.
Assistant Professor
Kaplan, Ann B.
Lecturer
Keefer, Laurie Anne
Instructor
Kieffer, Christine C.
Instructor
Kodl, Molly M.
Assistant
Krueger, Kristin R.
Instructor
Leavitt, Frank
Associate Professor
Lovallo, William R.
Visiting Professor
Luten, Alice G.
Visiting Assistant Professor
Mead, John D.
Assistant Professor
Meaden, Patricia M.
Assistant Professor
Mills, Megan
Assistant Professor
Nelson, Michael N.
Associate Professor
Nelson, Nathaniel W.
Assistant
Pisani, Vincent D.
Assistant Professor
Proske, Anthony
Assistant Professor
Revell, Victoria Louise
Instructor
Riggs, Laura L.
Assistant Professor
Ristanovic, Ruzica
Associate Professor
Rosen, Warren D.
Assistant Professor
Rybarczyk, Bruce D.
Associate Professor
Sexton-Radek, Kathleen
Visiting Professor
Smith, Clifford A.
Assistant Professor
Sobel, Hollie M.
Instructor
Stebbins, Glenn T., III
Associate Professor
Stepanski, Edward
Associate Professor
Stevens, Damien R.
Assistant Professor
Stewart, James D.
Assistant Professor
Swanson, Robert J.
Visiting Assistant Professor
Terebessy, Hilarie
Assistant Professor
Wasyliw, Orest
Assistant Professor
Williams, Betsy W.
Assistant Professor
Wilson, Robert S.
Professor
Wyatt, James
Assistant Professor
Young, Paula R.
Assistant Professor
Zomchek, Daniel S.
Instructor

Radiation Oncology

Saxena, V. Amod
Professor, Chair
Baker, Katherine F.
Assistant Professor
Barnes, Steven D.
Assistant Professor
Beck, Gerald G.
Instructor
Blazek, Ed Robert
Assistant Professor
Choo, Julia Jung
Assistant
Chu, James C.H.
Professor
Conterato, Dean
Assistant Professor
Elnaggar, Mini
Assistant
Gattuso, Paolo
Assistant Professor
Griem, Katherine L.
Associate Professor
Gupta-Burt, Shalina
Associate Professor
Kartha, Ponnunni K. I.
Associate Professor
Murthy, Anantha K.
Associate Professor
Nguyen, Cam
Associate Professor
Phillips, Alexander K.
Assistant Professor
Reddy, Salitha
Professor
Rubin, David B.
Assistant Professor

Saclarides, Theodore
Assistant Professor
Saroja, Kurubarahalli
Assistant Professor
Sarvi, Maygol
Assistant
Thakrar, Anupama Wadhwa
Assistant
Thakrar, Harish V.
Assistant Professor
Urbon, John
Assistant Professor
Zusag, Thomas W.
Assistant Professor

Religion, Health and Human Values

O'Reilly, Jo Ann
Assistant Professor, Chair (Acting)
Berndtson, Keith R.
Complemental Faculty
Brown, Max Douglas
Associate Professor
Burck, Russell
Associate Professor
Fitchett, George
Associate Professor
Murphy, Patricia Ellen
Assistant Professor
Nelson, Kristin A.
Assistant Professor
Rowe, John M.
Instructor
Sheldon, Mark Peter
Associate Professor
Wiens, Dolores F.
Instructor
Yellen, Suzanne B.
Complemental Faculty
Zbilut Joseph P.
Complemental Faculty

Urology

McKiel, Charles F., Jr.
Professor, Chair
Bormes, Thomas P.
Assistant Professor
Chaviano, Antonio Heriberto
Coogan, Christopher L.
Instructor
Cottrell, Thomas L. C.
Visiting Assistant Professor
Ekbal, Shahid S.
Assistant Professor
Elterman, Lev
Assistant Professor
Estrada, Carlos Roberto, Jr.
Assistant
Flanagan, Malachi J.
Professor
Frye, E. Kent
Instructor
Greenfield, Jason Michael
Assistant
Guinan, Patrick
Assistant Professor
Hoeksema, Jerome
Assistant Professor
Hoyme, Kermit
Instructor
Lash, Charles M.
Instructor
Latchamsetty, Kalyan C.
Assistant
Levine, Laurence Adan
Professor
Levine, Stanley R.
Assistant Professor
Lowenthal, Steven
Assistant Professor
Lux, Matthew M.
Assistant
Matkov, Thomas George
Assistant
Merrick, Paul Franklin
Instructor
Niederberger, Craig
Papierniak, Frank B.
Emeritus
Pessis, Dennis A.
Professor
Rubenstein, Marvin
Instructor
Sadoughi, Nader
Associate Professor
Slutsky, Joel N.
Instructor
Sobel, David Louis
Assistant
Sokovich, Ronald S.
Instructor
Stokes, Sam, III
Instructor

Vascular Ultrasound

McCarthy, Walter
Professor, Chair
Blackburn, Donna
Lecturer
Doherty, Susan J.
Lecturer
French-Sherry, Eileen
Lecturer
Hides, George Allen
Lecturer
Lozanski, Laurie
Pooley, Thomas Allan

Women's and Children's Health

Gross, Deborah A.
Professor, Chair (Acting)
Alexander, Maryann
Instructor
Angst, Denise B.
Complemental Faculty
Bezdek, Kathleen Jane
Instructor
Bolick, Beth Susan
Instructor
Bradford, Laura Sample
Instructor
Brown, Dawn
Instructor
Brundage, Joan
Complemental Faculty
Cahill, Maureen
Instructor
Carlson, Angela Marie
Assistant Professor
Celano, Robin
Complemental Faculty
Creaden, Julie Ann
Complemental Faculty
Cushing, Margaret
Complemental Faculty
Daly, Camilla S.
Instructor
Echiverri, Susan C.
Complemental Faculty
Evankoe, Sally A.
Instructor
Evans, Jacqueline
Complemental Faculty
Faux, Sandra Anne
Associate Professor
Friedrichs, Judy
Instructor
Gallagher, Diane M.
Instructor
Gallo, Agatha M.
Complemental Faculty
Grehn, Lauren
Halstead, Lois A.
Associate Professor
Heneghan, Kathleen E.
Instructor
Julion, Wrenetha A.
Assistant Professor
Kennelly, Christine
Assistant Professor
Labotka, Richard J.
Complemental Faculty
Levenberg, Patricia
Complemental Faculty
Maikler, Virginia
Associate Professor
Martin, Sarah A.
Instructor
Meier, Paula P.
Professor
Pacholski-Tomaka, Catherine
Complemental Faculty
Patterson, Marcia K.
Instructor
Rathnau, Claire
Complemental Faculty
Reimann, Dawn E.
Instructor
Rousseau, Jennifer
Instructor
Russell, Terri L.
Instructor
Salitore, Judith
Assistant Professor
Slack, Jeanne
Associate Professor
Sperhac, Arlene M.
Professor
Such, Roseann
Instructor
Trufant, Judy
Complemental Faculty
White, Melissa K.
Instructor
Willis, Lucy
Assistant Professor

Honorary Degree Recipients

1973
Robert J. Glaser, M.D.
President, Henry J. Kaiser Family Foundation

William George Anlyan, M.D.
Vice President, Health Affairs, Duke University

Mark Hummer Lepper, M.D.
Chairman, Comprehensive Health Planning Board State of Illinois

1974
Robert Higgens Ebert, M.D.
Caroline Shields Walker Professor of Medicine
Dean of the Faculty of Medicine, Harvard Medical School

1975
John H. Knowles, M.D.
President, Rockerfeller Foundation

Virginia Henderson, M.A.
Senior Research Associate Emeritus, School of Nursing, Yale University

1976
James Harvey Young, Ph.D.
Professor of History, Emory University

Jessie M. Scott, R.N., M.A.
Assistant Surgeon General and Director, Division of Nursing, Health Resources Administration, United States Department of Health, Education and Welfare

1977
David A. Hamburg, M.D.
President, Institute of Medicine of the National Academy of Sciences

1978
Julius B. Richmond, M.D.
Assistant Secretary, United States Department of Health, Education, and Welfare

1979
Gerard Piel, B.A.
Publisher and President, Scientific American

1980
Harriet Waltzer Sheridan, Ph.D.
Dean of the College, Brown University

1981
Thomas H. Hunter, M.D.
The Owen R. Cheatham Professor of Science. Director, Program in Human Biology and Society, University of Virginia School of Medicine

1982
Walter J. McNerney, M.H.A.
Past President of the Blue Cross and Blue Shield Association, Professor of Health Policy, Northwestern University

1983
Baruch S. Blumberg, M.D., Ph.D.
Nobel Laureate, Associate Director and Senior Member, Clinical Research, Institute for Cancer Research, Philadelphia, Pennsylvania

1984
Julius R. Krevans, M.D.
Chancellor, University of California at San Francisco

James A. Campbell, M.D. (1917-1983)
President, Rush-Presbyterian-St. Luke's Medical Center (1969-1983)

1985
Eli Ginzberg, Ph.D.
The A. Barton Hepburn Professor Emeritus of Economics, Columbia University

David Elliott Rogers, M.D.
President, The Robert Wood Johnson Foundation

Virginia V. Weldon, M.D.
Vice President, Washington University Medical Center

Edward N. Brandt, Jr., M.D., Ph.D.
Chancellor, University of Maryland, Baltimore

1986
Edward J. Stemmler, M.D.
Dean, University of Pennsylvania School of Medicine

1987
150th Anniversary Commencement
The Honorable Dan Rostenkowski
Eighth Congressional District of Illinois, United States House of Representatives

Raymond C. Baumhart, S.J.
President, Loyola University of Chicago

Arnold R. Weber, Ph.D.
President, Northwestern University

Hanna Holborn Gray, Ph.D.
President, The University of Chicago

Stanley O. Ikenberry, Ph.D.
President, The University of Illinois

1988
Samuel O. Thier. M.D.
President, The Institute of Medicine of the National Academy of Sciences

1989
Leon M. Lederman, Ph.D.
Director, Fermi National Accelerator Laboratory

Harold Byron Smith, Jr.
Trustee, Rush-Presbyterian-St. Luke's Medical Center

1990
Louis W. Sullivan, M.D.
Secretary, United States Department of Health and Human Services

1992
Stuart Harold Altman, Ph.D.
Dean, Florence Heller Graduate School, Brandeis University

1993
Margaret E. Mahoney
President, The Commonwealth Fund

1994
Steven A. Schroeder, M.D.
President, The Robert Wood Johnson Foundation

1995
J. Robert Buchanan, M.D.
General Director Emeritus, Massachusetts General Hospital

1996
Clair M. Fagin, Ph.D.
Leadership Professor and Dean Emeritus, University of Pennsylvania, School of Nursing

1997
Gail R. Wilensky, Ph.D.
John M. Olin Senior Fellow, Project HOPE

1998
The Honorable John Edward Porter
Tenth Congressional District of Illinois, United States House of Representatives

1999
Edmund D. Pelligrino, M.D.
Director, Center for Clinical Bioethics and The John Carroll Professor of Medical and Clincial Bioethics, Georgetown University

2000
Whitney W. Addington, M.D.
Past President, American College of Physicians
President, Chicago Board of Health, Director, Primary Care Institute, RPSLMC, and Professor of Medicine, Family Medicine, Preventive Medicine

2001
Roger J. Bulger, M.D.
President and Chief Executive Officer, Association of Academic Health Centers

2002
Ruth M. Rothstein
Chief of the Cook County Bureau of Health Sciences

2003
Benjamin S. Carson, Sr., M.D.
Director, Pediatric Neurosurgery, Johns Hopkins Medical Institutions

2004
Warner Saunders
Co-anchor, NBC5 News

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MEDICAL CENTER